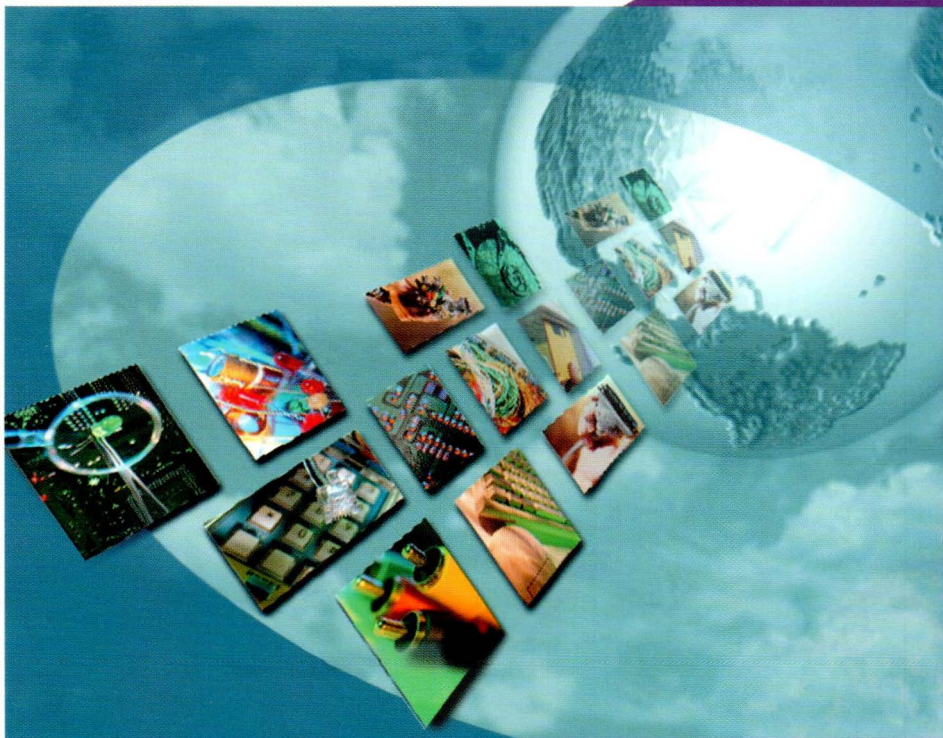


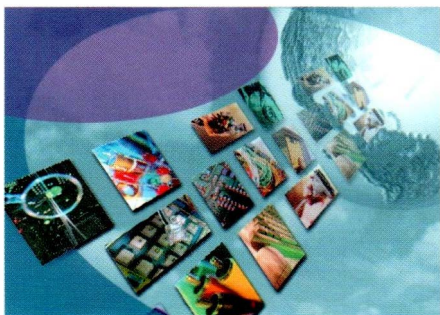
Meridian 1

Telephone and Console Description Reference Guide



Meridian 1

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Attendant Consoles Description

553-2201-117

Meridian 1 Telephones Description and Specifications

553-3001-108

Meridian 1 European Digital Telephones

553-3001-114

**M3900 Series Meridian Digital Telephones
Description, Installation and Administration**

553-3001-216

Meridian 1

Attendant Consoles

Description

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Revision history

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Standard 10.00. This document is up-issued to include content changes for Meridian 1 Internet Enabled Release 25.40.

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Standard 9.00. This is a global document and is up-issued for X11 Release 25.0x. Document changes include removal of: redundant content; references to equipment types except Options 11C, 51C, 61C, and 81C; and references to previous software releases.

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August 1996

Standard, release 7.00. This document updated for X11 Release 22.0x.

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Standard, release 6.00. This document is reissued to include updates and changes for X11 Release 21.0.

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Standard, release 5.00. This document is reissued to include updates and changes for X11 Release 20.0x and M2250 Attendant Console enhancements.

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Removed all references to MJ1250 console.

February 1989

Standard for M1250 Console issued.

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About this document

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described are supported in your area.

Introduction

Reference list

The following are the references in this section:

- *Equipment Identification (553-3001-154)*
- *Meridian 1 Attendant PC: Software User Guide*

Feature description

Attendant consoles are designed to assist in placing and extending calls into and out of a telephone switching system. The console is operated by an attendant who is the human interface between the system and the users.

Several types of attendant consoles are designed for telephone traffic control in the Meridian 1. Each provides attendants with specialized features that increase the speed and ease of call processing.

This document describes the M1250 and M2250 attendant consoles, and the Meridian 1 Attendant PC Software application. The M1250 and M2250 consoles are functionally compatible with the QCW4 Attendant Console.

- The M1250 is designed to work in analog mode and functions through an analog line card when connected to a digital switch. Its cabling schemes are compatible with those of the QCW4 console.
- The M2250 is a digital version of the M1250, offering additional features. A digital line card connects the M2250 to the Meridian 1. It has a modified cabling scheme.

- The Meridian 1 Attendant PC Software application allows all functions supported by the M2250 to be performed on a computer workstation using a mouse pointing device or keyboard within a Windows 95® operating system environment. The M2250 attendant console is not required to run the Meridian 1 Attendant PC Software application. Refer to the *Meridian 1 Attendant PC: Software User Guide* for more information on Meridian 1 Attendant PC Software.

Refer to Table 1 for engineering and ordering codes for the types and colors of the M1250 and M2250 attendant consoles. For more ordering information, refer to *Equipment Identification* (553-3001-154).

Table 1
Engineering and ordering codes for the M1250 and M2250 and related equipment

Console model	Engineering code	Color	Ordering (CPC) code
M1250	NT2G00AC-35	Chameleon gray (ash)	A0387385
M1250	NT2G00AA-98	BTS dark gray	A0338244 (not available in North America)
M2250	NT6G00AF-35	Chameleon gray (ash)	A0393450
M2250	NT6G00AE-98	BTS dark gray	A0349187 (not available in North America)
BLF/CGM	NT3G40AB-35	Chameleon gray (ash)	A0375234
BLF/CGM	NT3G40AB-98	BTS dark gray	A0349423 (not available in North America)
Adjustable stand	NT3G30AA-35	Chameleon gray (ash)	A0348780
Adjustable stand	NT3G30AA-98	BTS dark gray	A0348778 (not available in North America)
ASM	NT7G10AA	N/A	A0366221
16V DC Power Supply (300 mA)	N/A	N/A	A0367601

The M1250 and M2250 have the following features:

- A four-line, 40 character, liquid crystal display (LCD) with backlighting. Power, including backlighting, is maintained during building power failures with the Meridian 1 battery backup, if equipped.
- or
- A two-line, 23 character, liquid crystal display (LCD) with backlighting (M2250 only).
- Angle adjustment of the display screen, which can be tilted through 90° from horizontal to fully vertical.
- Scrolling control of lines 2 and 3 of the display screen.
- In Shift mode, the M1250 console can have up to 16 trunk group busy (TGB) keys, and the M2250 can have up to 20 TGB keys. This eliminates the need for any QMT-2 key/lamp strip add-on modules.
- In Shift mode, the M2250 can have up to 10 extra flexible feature keys for a total of 20.
- An optional supporting stand that can be adjusted to nine different positions.
- A handset and headset volume slider control, situated below the dial pad.
- A physical connection to a serial data port through a subminiature D-type female connector on the console back wall. This permits connection of the console to the serial port of a personal computer.
- An optional Busy Lamp Field/Console Graphics Module (BLF/CGM), which displays the status of up to 150 consecutive extensions (SBLF) or any group of 100 extensions within the system (EBLF) and has many text and graphics capabilities.
- An optional Attendant Supervisory Module (ASM) can be installed.
- To meet international requirements, the M2250 provides 16 transmission levels that facilitate acceptance and processing of information downloaded from the system (when supported by software).
- Multi-language selection.
- Menus for local console features (Options menu) and diagnostics (Diagnostics menu).
- Code blue or emergency relay (associated with ICI 0).

- Time and date system download on the M2250.
- Alert tone volume and frequency selection.
- Electret or carbon transmitter support.
- Power Fail Transfer switch.
- Keyclick (M2250 only).

Description

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This section contains information on the following topics:

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Reference list

The following are the references in this section:

- *Telephone and Attendant Console: Installation* (553-3001-215)

Feature description

Figure 1 on page 19 and Figure 2 on page 20 show top views of the layouts of the M1250 and M2250 attendant consoles, respectively. The user-accessible components are labeled using a row/column grid arrangement. Figure 3 on page 21 shows rear, left side, and bottom views of the consoles. These illustrations show where to find the various components.

Physical details

The attendant console dimensions are as follows:

Width	425 mm (16.75 in.)
Depth	245 mm (9.6 in.)
Height (front)	25 mm (1 in.)
Height (back)	65 mm (2.5 in.)
Height (with display screen panel up)	115 mm (4.5 in.)
Weight	approximately 2.75 kg (6 lbs)

Keyboard layout

Refer to Table 2 on page 22 for the description of keys and Figures 1, 2, and 3 for the location of switches and keys mentioned in this section.

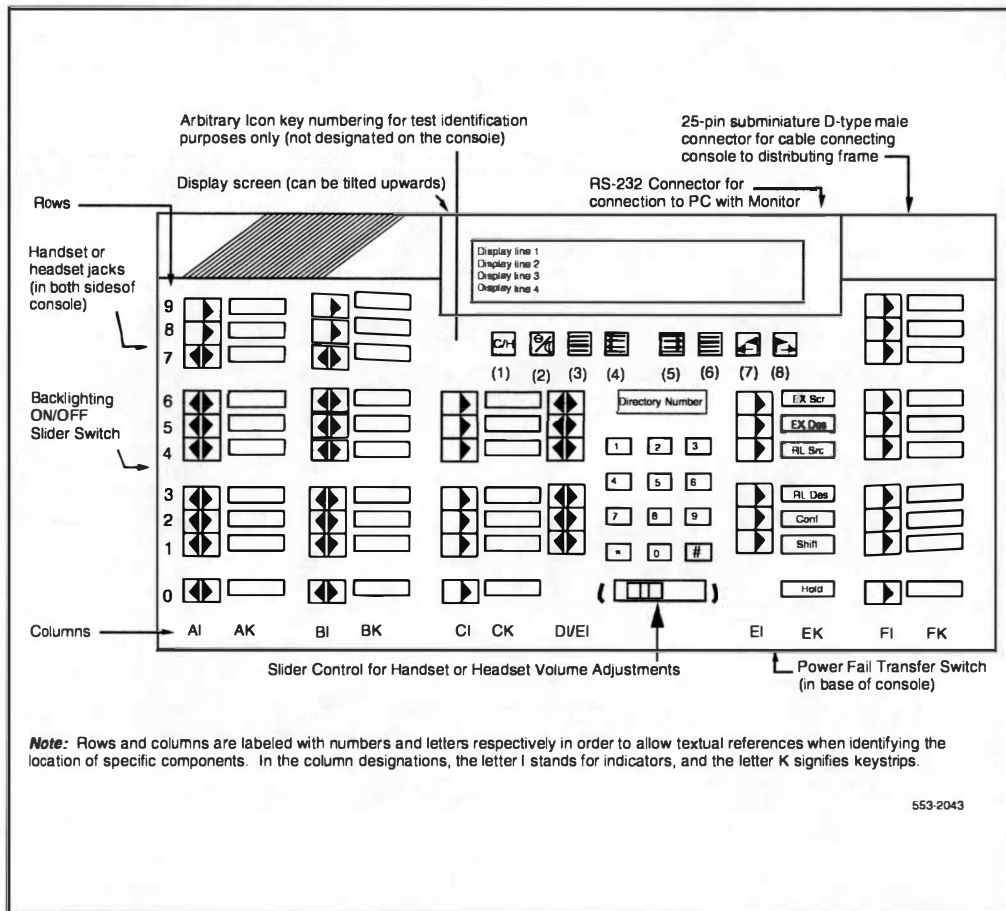


Figure 1
M1250 attendant console – top view

Figure 2
M2250 attendant console – top view

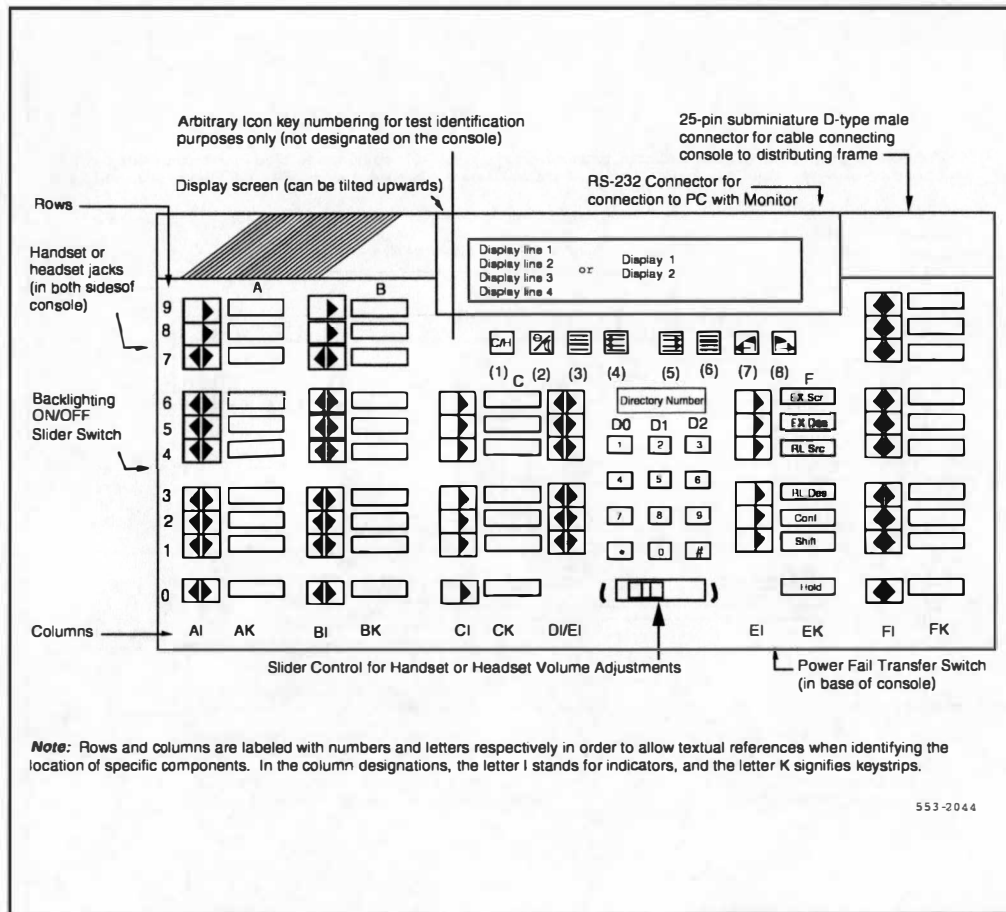
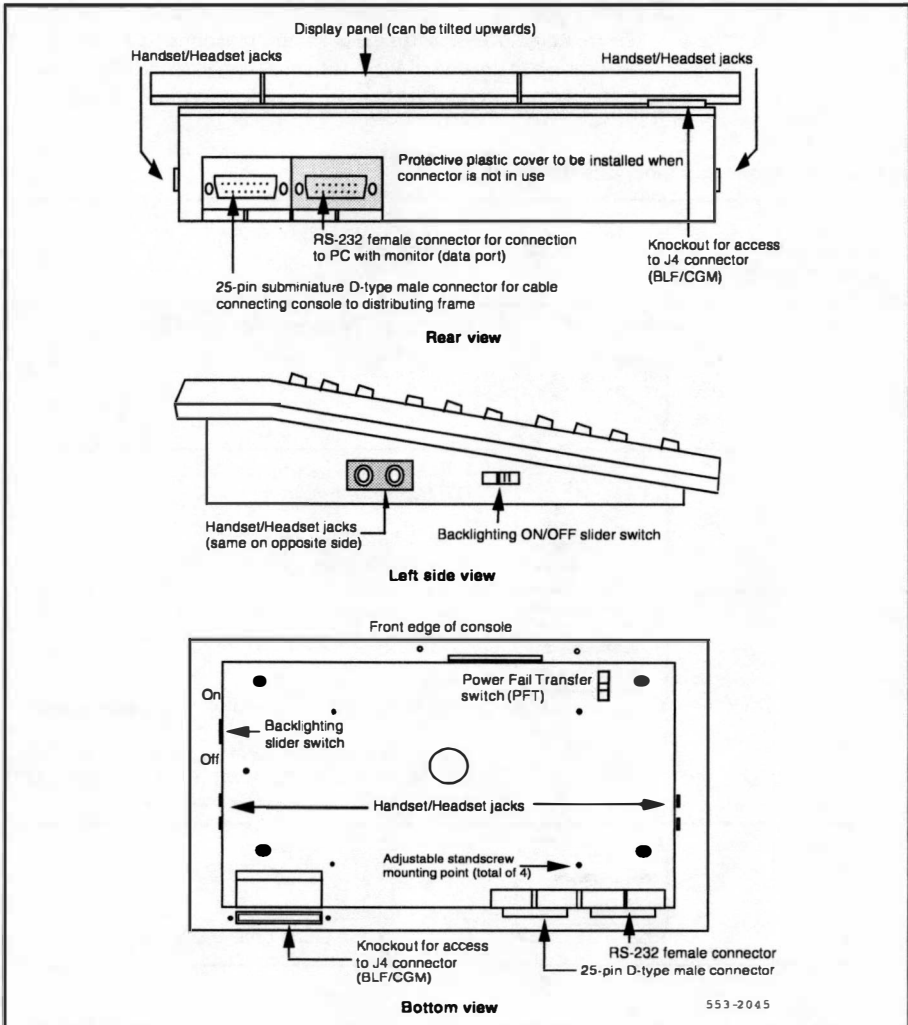


Figure 3
M1250 and M2250 attendant consoles – rear, left side, and bottom views



Function keys

The attendant console has eight function keys, located directly below the display screen. Refer to Table 2 for the positions, functions, and markings of these keys. For an explanation of the functions assigned to the rest of the attendant console keys, refer to “Attendant console operation” on page 29.

Table 2
Softkey definitions and functions (Part 1 of 2)

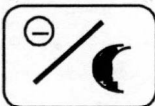
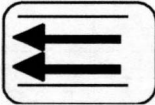
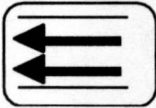
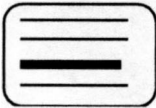
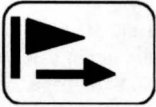
Key number (as shown in Figures 1 and 2)	Key	Function
(1)		Centralized Attendant Service (CAS) File
(2)		Prime function (normal): Position Busy feature Level 1 function (Shift): Night Service feature
(3)		Prime function (normal): Selects display screen line 2 for scrolling. Level 1 function (Shift): Selects the Options menu on the display screen. Alternating between the idle and active call display (M2250 only). From the idle display, press this key to show the active call display.
(4)		Prime function (normal): Scrolls the currently selected line to the left. Level 1 function (Shift): Decreases the alert speaker volume.

Table 2
Softkey definitions and functions (Part 2 of 2)

Key number (as shown in Figures 1 and 2)	Key	Function
(5)		Prime function (normal): Scrolls the currently selected line to the right. Level 1 function (Shift): Increases the alert speaker volume.
(6)		Prime function (normal): Selects line 3 on display screen for scrolling. Level 1 function (Shift): Selects the Diagnostics menu on the display screen. (On the M2250 console, the Diagnostics menu is password-protected. To display it, the user must enter a 4-digit password and press * on the dial pad.) Alternating between the idle and active call display (M2250 only). From the active call display, press this key to show the idle display.
(7)		Prime function (normal): Signal Source feature key Level 1 function (Shift and Conf/Busy Lamp Field key): Used with the Busy Lamp Field/Console Graphics Module, as CGM key.
(8)		Prime function (normal): Signal Destination feature key Level 1 function (Shift): Used with the Busy Lamp Field/Console Graphics Module, as the Mode key.

Switches

A slider control, located below the dial pad, between columns DI/EI and FI, controls the handset and headset receive volume level. See Figures 1 and 2.

A Power Fail Transfer (PFT) switch is located in the baseplate. See Figure 3 on page 21. Both the line connector and the RS-232 connector for the PC port are located at the back of the console.

Shift key

The Shift key, mentioned earlier, is positioned in column FK, row 1, just above the Hold key. See Figures 1 and 2. It is used to access Level 1 mode functions.

Handset and headset jacks

Two pairs of jacks are provided for plugging in handsets or headsets. The jacks are located on both sides of the console beneath the faceplate in the recessed area shown by the arrows. See Figures 1 and 2. The console accepts both carbon and electret handsets or headsets and automatically adapts itself to each type.

Note: Electret headsets and handsets are polarity sensitive and must be correctly inserted into the jack.

LCD indicators

The LCD indicators on the M1250 and M2250 display triangular symbols that normally point towards the key with which they are associated. Certain keys in the QMT2 mode of operation and loop keys have two LCDs associated with each key instead of one.

On the M2250, every LCD can flash at 30, 60, or 120 impulses per minute (ipm). On the M1250 console, certain lamps can flash only at 60 or 120 ipm. Refer to "Attendant console operation" on page 29 for more details.

The M2250 attendant console has 10 more flexible features than the M1250 attendant console. These are programmed in LD12 and accessed using the Shift key.

Display screen messages

Source information appears on line 2 of the display screen. Destination information appears on line 3 of the display screen.

The status messages listed below appear on line 4 of the display screen panel.

- MN (minor alarm)
- MJ (major alarm)
- C/H (CAS/History File)
- CW (Call Waiting)
- BUSY (Position Busy)
- NIGHT (Night Service)
- IDLE (Idle)
- ACTIVE (lpk has been selected)
- S (Shift mode) Only on the M2250 and later releases of the M1250.
- EMERGENCY (Power Fail Transfer (PFT) feature is activated.)

Connections

The line cord connects to the rear of the attendant console through a 25-pin subminiature D-type connector. The jack connector is attached to the line cord for user safety and equipment protection (pins are not exposed). Having the plug connector mounted in the console also prevents interchanges between the line cord and the serial data port connectors (the serial data port in the console has a jack connector).

Identical two-prong G3 type connectors are provided on each side of the console body to permit handset or headset connection at either side of the console. The attendant console is compatible with both carbon and electret handsets or headsets. The electret handset plug is orientation-dependent and is labeled accordingly.

The M2250 attendant console is connected to the Meridian 1 through two digital ports (primary and secondary) with three additional ports for powering. The M1250 uses two hybrid ports (primary and secondary) for connection to the Meridian 1, with two additional ports for powering.

The M2250 console requires a digital line card or an Integrated Services Digital Line Card (ISDLC) of vintage D or later. The M1250 requires a QPC61 or QPC451 line card.

Local console controls

Visual contrast on the display panel can be adjusted using the Contrast option on the Options menu.

From the Options menu, four-line mode can be changed to two-line mode for easier viewing and to use larger fonts.

The pitch and volume of the buzz tone on the console can be adjusted by the user.

Any one of 15 languages (English, French, Spanish, German, Italian, Norwegian, Irish, Turkish, Katakana, P.R.C. (People's Republic of China), Taiwan, Korean, Polish, Czech/Slovak or Hungarian) can be chosen for the console screen displays.

When the languages P.R.C., Taiwan, and Korean are chosen, the M2250 uses two-line display.

The attendant console is equipped with a real-time clock/calendar. The time of day (hours, minutes, and seconds) and the date (day, month, and year) are displayed on line 1 of the display screen.

The sound of key clicks can be turned on or off. On the M2250, the pitch and volume of key clicks can be adjusted.

Busy Lamp Field/Console Graphics Module

The Busy Lamp Field/Console Graphics Module (BLF/CGM) can be added to an M1250 or M2250 attendant console.

The BLF/CGM can do the following:

- display the status (busy or idle) of up to 150 consecutive extensions within the Meridian 1 Standard Busy Lamp Field (SBLF)
- display the status (busy or idle) of any hundreds group of DN's within the system Enhanced Busy Lamp Field (EBLF)
- display which attendant console is the supervisory console and which consoles are active
- display supplementary information about individual extensions, such as the reason the person is away (business, vacation, or illness), when the person is due to return, and an alternate extension where calls to the person should be directed
- display a company logo
- display graphics
- display text in any one of eight languages
- have its screen contrast adjusted for easy viewing

Installation

The BLF/CGM mounts on the back of the attendant console and is held on by snapfits and screws. It is connected to the console using a 16-way connector that is located on the keyboard Printed Circuit Board (PCB). This connector is accessed through a rectangular knockout section located underneath the casing overhang at the Meridian logo location. See Figure 3 on page 21.

For more on installing the BLF/CGM, refer to *Telephone and Attendant Console: Installation* (553-3001-215). For more on the features and operation of the BLF/CGM, refer to the Busy Lamp Field/Console Graphics Module user guide.

Power requirements

The BLF/CGM obtains its power through the attendant console.

To provide backlighting for the BLF/CGM display, an external floating 16 V dc (300 mA) power supply (A0367601) must be cabled in at the local Main Distribution Frame (MDF) at a maximum of 35 m (115 ft) from the attendant console.

Display backlight power supply option

An optional 16 V dc power supply (A0367601) can be installed to the MDF to improve the display backlight brightness.

Attendant console operation

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This section contains information on the following topics:

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Reference list

The following are the references in this section:

- *Networking Features and Services* (553-2901-301)
- *Features and Services* (553-3001-306)
- *Administration* (553-3001-311)

This section presents an overview of operating procedures for the M1250 and M2250 attendant consoles. The attendant console faceplate layout is shown in Figures 1 and 2 on pages 19 and 20. Use these illustrations as the basis for component location references throughout this document.

M1250/2250 configurations

The M1250 and M2250 attendant consoles can be configured to operate with the QMT2 feature, which is provided by a QMT2 add-on module incorporated in the console. Instead of having to add a keystrip unit, the technician can set a dip switch on the keyboard/controller Printed Circuit Panel (PCP) to ON (enable QMT2) or OFF (disable QMT2). It is important that the system software configuration and the QMT2 dip switch be set correctly. For more information, refer to the section on LD 15 in the following publications:

- *Features and Services* (553-3001-306)
- *Administration* (553-3001-311)

QMT2 feature disabled

When the QMT2 feature is disabled, the following conditions apply:

- If the console is not in Shift mode, keystrip AK is inactive.
- If the console is in Shift mode, the keys in strip AK function as Trunk Group Busy (TGB) keys, if configured in the system software.
- If the operator presses any of these keys, the associated trunk group is busied out.
- The triangle points aimed to the left of keystrip AK are never active.
- If the operator presses any key outside keystrip AK when the console is in Shift mode, the console performs the function associated with that key. The Shift indicator remains on.
- The keys in keystrip BK function as Incoming Call Identification (ICI) keys.

QMT2 feature enabled

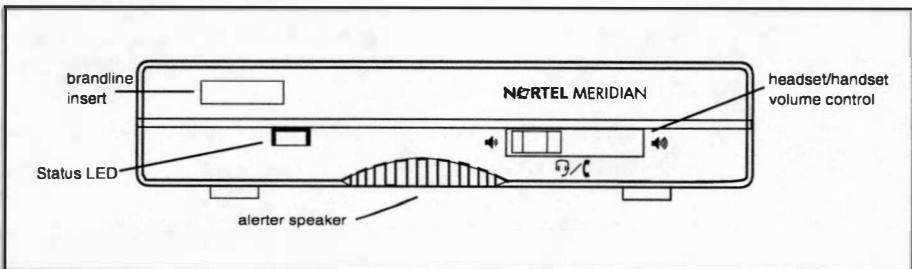
When the QMT2 feature is enabled, the following conditions apply:

- If the console is not in Shift mode, the keys in strip AK and/or BK function as Incoming Call Identification (ICI) keys.
- If the console is in Shift mode, the keys in keystrips AK and BK function as Trunk Group Busy (TGB) keys. That is, they imitate the keystrips of the QMT2 add-on module as follows:
 - The LCD indicators pointing to the left indicate busy trunks.
 - The LCD indicators pointing to the right indicate incoming calls.

Meridian 1 Attendant PC configuration

The Meridian 1 Attendant PC Software application operates with the Attendant PC Unit. See Figure 4 on page 32. The Attendant PC Unit is typically installed under the attendant's PC monitor, and provides connection to the Meridian 1 MDF and PC communications port. The Attendant PC Unit hardware allows the software to communicate with the Meridian 1 and simulate M2250 operation through a Windows 95® operating system environment. The Attendant PC Unit is configured in LD 12. Refer to *Administration* (553-3001-311) for configuration information.

Figure 4
Meridian 1 Attendant PC Unit



To install the Meridian 1 Attendant PC Software, an MPC 2-compliant PC compatible Pentium system is required, with the following:

- minimum 16 MB RAM

- hard disk with at least 4 MB free disk space
- 17-inch color monitor (SVGA recommended)
- MPC-2 16 bit sound board
- Network interface adapter

For complete installation and operation instructions, refer to the *Meridian 1 Attendant PC Installation Guide* and *Meridian 1 Attendant PC User Guide*.

M1250/2250 feature key modes

Functions shown for some of the feature keys in Table 2 page 22 vary, depending on which console mode is in effect while the key is being pressed. Table 1 on page 34 lists the various alternate feature key functions.

When a feature key is pressed while the attendant console is in a mode other than normal or Level 1, nothing happens.

When in the normal call processing mode, access the Level 1 mode by pressing the Shift key. The LCD indicator beside the shift key lights and remains on throughout all options and menus. , It goes out only upon return to normal call processing. All call processing keys that do not have a dual function perform normally while the console is in Level 1 mode. Press the Shift key again to return to normal call processing.

On early releases of the M1250 attendant console, press the pound (#) key to return from any menu on the display screen to the Level 1 mode. On the M2250 attendant console and later releases of the M1250, press the pound (#) key to exit from any submenu from the Options menu, or from the Diagnostics menu to normal operating mode. Press the Shift key to return to the Level 1 mode.

Level 1 mode also provides access to additional call processing features, as well as to options and maintenance features. One of the additional call processing features is access to Trunk Group Busy (TGB) keys that are locked out in normal mode. For example, in normal mode, there are eight available TGB keys on the M1250 and 10 on the M2250. With QMT2 enabled, the number of TGB keys on each console is doubled.

Table 1
Softkey alternate functions

Key	Operational mode	Function
F1	Normal	Selects line 2 of the display for scrolling.
F2	Normal	Scrolls left on the selected line, at 8 characters per step.
F3	Normal	Scrolls right on the selected line, at 8 characters per step.
F4	Normal	Selects line 3 of the display screen for scrolling.
Shift, F1	Level 1	Selects the Options menu.
Shift, F2	Level 1	Turns down the alerter speaker volume.
Shift, F3	Level 1	Turns up the alerter speaker volume.
Shift, F4	Level 1	Selects the Diagnostic menu. (A password must be entered on the M2250 before the Diagnostics menu appears.)
Example: Press Shift and F1 (in sequence)	Options menu	The Options menu is displayed.
	Press dial pad key 1	Accesses Contrast menu. (Refer to user guide for contrast setting routines.)
	Press dial pad key #	Returns to Options menu.

M1250/2250 console diagnostics

Use the Diagnostics menu to check the functions of the console and to perform tests. To enter the Diagnostics mode, use the following procedure. Figure 5 shows the main Diagnostics menu for the M1250 and M2250 attendant consoles.

- 1 Press the Shift key.
- 2 Press the  key (function key F4).
- 3 On M2250 consoles, enter password "9999."
- 4 Press the asterisk (*) key to enter Diagnostics menu 1. To toggle between menu 1 and menu 2, press the asterisk (*) key.
- 5 To quit the Diagnostics mode, press the pound (#) key.

Follow the procedures listed below to perform the Diagnostic tests.

Figure 5
Console Diagnostics menus

{ 1 }

DIAGNOSTICS MENU:

1. KEYBOARD	2. LAMPS	3. DATA PORT
4. ICs	5. LAMP FIELD	6. ALERTER
* <next>		# <exit>

{ 2 }

DIAGNOSTICS MENU:

1. DISPLAY	2. FIRMWARE	3. QMT2
4. CONTROL	5. RESET	
* <next>		# <exit>

Keyboard

Use this procedure to check the functionality of each key on the console. When a key is pressed, its location code is displayed within parentheses. For example, (00) denotes the upper left-hand ICI key.

- 1 From Diagnostics menu 1, press "1."
- 2 Press any key on the console. The display shows the key's location code, indicating that the key is functional. Table 2 shows the key location codes.
- 3 Press the pound (#) key to exit and return to Diagnostics menu 1.

Table 2**Key location codes for console diagnostics**

		22	21	20	34		54	60	61	62		
00	10								70		80	90
01	11								71		81	91
02	12								72		82	92
03	13	23						63	73		83	93
04	14	24						64	74		84	94
05	15	25		35	45	55		65	75		85	95
06	16	26		36	46	56		66	76		86	96
07	17	27		37	47	57		67	77		87	97
08	18	28		38	48	58		68	78		88	98
09	19	29						69	79		89	99

Lamps

Use this procedure to check the functionality of each LCD indicator on the console.

- 1 From the Diagnostics menu 1, press "2."
- 2 Press 1 to turn all lamps ON. Press the asterisk (*) to turn each lamp OFF one by one.
- 3 Press 2 to turn all lamps OFF. Press the asterisk (*) to turn each lamp ON one by one.
- 4 Press the pound (#) to exit and return to Diagnostics menu 1.

Data Port

Use this procedure to perform a loopback test on the RS-232 port at the back of the console. Before performing the test, a connector (25-way D-plug) with pin 2 shorted to pin 3 should be inserted in RS-232 port. A failure code is displayed if any error is found.

- 1 From Diagnostics menu 1, press "3." The display shows "OK" if the test is successful.
- 2 Press the asterisk (*) to repeat the loopback test.
- 3 Press the pound (#) to exit and return to Diagnostics menu 1.

ICS

Use this procedure to check the functionality of any peripheral devices connected to the User interface printed circuit card UIP and audio and system interface printed circuit card ASIP microprocessors within the console. A failure code is displayed if any error is found.

- 1 From Diagnostics menu 1, press "4."
- 2 Press the asterisk (*) to perform the IC test.
- 3 Press the pound (#) to exit and return to Diagnostics menu 1.

Lamp Field

Use this procedure to check the functionality of the Busy Lamp Field/Console Graphics Module. Once in this menu, the dial pad is in CGM mode. When any dial pad keys are pressed, except the pound (#) key, the keys are echoed on the BLF/CGM Module.

- 1 From Diagnostics menu 1, press "5."
- 2 Press keys 0 through 9 and the asterisk (*) on the dial pad. Check the CGM to see that they are echoed.
- 3 Press the pound (#) to exit and return to Diagnostics menu 1.

Alerter

Use this procedure to check the pitches and volume levels of the alerter and auxiliary tone channel.

- 1 From Diagnostics menu 1, press "6."
- 2 Follow these instructions in any order:
Press key "1" to turn the buzz and auxiliary tones ON.
Press key "2" to turn the buzz and auxiliary tones OFF.
Press key "3" to increase the pitch of the buzz and auxiliary tones.
Press key "4" to decrease the pitch of the buzz and auxiliary tones.
Press key "5" to increase the volume of the buzz and auxiliary tones.
Press key "6" to decrease the volume of the buzz and auxiliary tones.
- 3 Press the pound (#) to exit and return to Diagnostics menu 1.

Display

Use this procedure to check the functionality of the alphanumeric display panel. Cycle through a number of different display patterns to check for visual defects.

- 1 From Diagnostics menu 2, press "1."
- 2 Press the asterisk (*) to change the display screen pattern. Continue changing the pattern until all the patterns have been cycled through.
- 3 Press the pound (#) to exit and return to Diagnostics menu 1.

Firmware

Use this procedure to display the release and issue numbers of the firmware installed on the UIP and ASIP microprocessor boards.

- 1 From Diagnostics menu 2, press "2." The display shows the firmware release and issue numbers, as shown below:

```
DIAGNOSTICS:  FIRMWARE
                ASIP: XX XX
                UIP:  XX XX
```

- 2 Press the pound (#) to exit and return to Diagnostics menu 1.

QMT2

Use this procedure to display the current state of the QMT2 dip switch inside the console and to change the setting for verification testing (LD 31). After a change, the actual switch setting will return to its original state after a timeout period of about three minutes.

- 1 From Diagnostics menu 2, press "3".
- 2 Press the asterisk (*) to toggle between QMT2 ON and OFF.
- 3 Press the pound (#) to exit and return to Diagnostics menu 1.

Control

Use this procedure to turn the conference bridge analog control gates, the auxiliary tone channel, and the Code Blue Relay ON or OFF. Note that the auxiliary control only affects the control gate on the ASIP board. To actually generate a tone, use the Alerter menu.

- 1 From Diagnostics menu 2, press "4."

```
DIAGNOSTICS: CONTROL
```

1. SCR	2. DST	3. ARX	4. ATX	5. TON	6. REL
{ 0 }	{ 0 }	{ 0 }	{ 0 }	{ 0 }	{ 0 }
* <OFF>				# <exit>	

- 2 Follow the appropriate instruction below:

Press key "1" to toggle the primary control gate between ON and OFF.

Press key "2" to toggle the secondary control gate between ON and OFF.

Press key "3" to toggle the attendant receive control between ON and OFF.

Press key "4" to toggle the attendant transmit control between ON and OFF.

Press key "5" to toggle the auxiliary tone control between ON and OFF.

Press key "6" to toggle the relay control between ON and OFF.

- 3 Press the asterisk (*) to turn all the control gates OFF.
- 4 Press the octothorp (#) to exit and return to Diagnostics menu 1.

Reset

Use this procedure to perform a hard reset of the console. All devices and memory on the UIP and ASIP boards are reset as if the power cord were unplugged and plugged in again.

- 1 From Diagnostics menu 2, press "5." The reset is performed immediately.

M1250 failure codes

A failure code will appear on the display screen in response to the detection of a hardware fault. Refer to Table 3 for an explanation of failure codes and possible solutions.

Table 3
M1250 failure codes (Part 1 of 2)

Failure code	Reason	What to do
20 H	The 6818 RTC, U6, is faulty.	Unplug the line cord and plug it in again. If the failure code still appears, there is an electrical fault in the console, and it should be returned. Note: Log the failure code with the returned unit, as the code gives an indication of which component has failed.
10 H	The RAM IC, U10, is faulty.	Same as for 20H.
08H	A key in column A is stuck.	Unplug the line cord. Free the key that is stuck. Plug in the line cord. If the failure code still appears, the console is faulty and should be returned.
09H	A key in column B is stuck.	Same as for 08H.
0AH	A key in column C is stuck.	Same as for 08H.
0BH	A key in column D0 is stuck.	Same as for 08H.
0CH	A key in column D1 is stuck.	Same as for 08H.
0DH	A key in column D2 is stuck.	Same as for 08H.

Table 3
M1250 failure codes (Part 2 of 2)

Failure code	Reason	What to do
0EH	A key in column E is stuck.	Same as for 08H .
0FH	A key in column F is stuck.	Same as for 08H .
C0H	The SRC micro is not responding.	Same as for 20H .
90H	The RS-232 port has failed the loopback test.	Check to see if the loopback connector is inserted. If not, insert it and perform the loopback test again. If the failure code still appears, turn the console off and on while the connector is inserted. Redo the loopback test. If the failure code still appears, the console is faulty and should be returned.
88H	The EPROM, U18, does not contain the correct ID, or is faulty.	Same as for 20H .

The failure codes produced by the firmware are bit-significant, as follows:

B7	B6	B5	B4	B3	B2	B1	B0
0	USART	RTC	RAM	KEYS	c2	c1	c0*
1	SRC	BLF	RS232	EPROM	0	0	0
* Refers to key's column number.							

In most instances, the failure code accurately identifies the faulty hardware component. However, if the microprocessor is faulty, the readings may be unreliable or misleading.

Failure code 90H is always shown if the loopback test has not been performed. Refer to "Data Port" on page 37.

M2250 failure codes

A failure code appears on the display in response to the detection of a hardware fault.

Refer to Table 4 for an explanation of failure codes and possible solutions.

Table 4
M2250 failure codes (Part 1 of 2)

Failure code	Printed circuit pack (PCP)	Reason	What to do
40H	UIP	The PSG, U13, is not responding.	Unplug the line cord and plug it in again. If the failure code still appears, there is an electrical fault in the console, and it should be returned. Note: Log the failure code with the returned unit, as it gives an indication of which component has failed.
20H	UIP	The RTC, U16, is faulty.	Same as for 40H.
10H	UIP	The RAM IC, U1, is faulty.	Same as for 40H.
08H	UIP	A key in column A is stuck.	Unplug the line cord. Free the key if it is stuck. Plug in the line cord. If the failure code still appears, the console is faulty and should be returned.
09H	UIP	A key in column B is stuck.	Same as for 08H.
0AH	UIP	A key in column C is stuck.	Same as for 08H.
0BH	UIP	A key in column D0 is stuck.	Same as for 08H.

Table 4
M2250 failure codes (Part 2 of 2)

Failure code	Printed circuit pack (PCP)	Reason	What to do
0CH	UIP	A key in column D1 is stuck.	Same as for 08H .
0DH	UIP	A key in column D2 is stuck.	Same as for 08H .
0EH	UIP	A key in column E is stuck.	Same as for 08H .
0FH	UIP	A key in column F is stuck.	Same as for 08H .
A0H	ASIP	The RS-232 has failed the loopback test.	Check to see if the loopback connector is inserted. If not, insert it and perform the loopback test again. If the failure code still appears, turn the console off and on while the connector is inserted. Perform the loopback test again. If the failure code still appears, the console is faulty and should be returned.
90H	ASIP	ASM A44#3, U1, is faulty.	Same as for 40H .
88H	ASIP	Secondary A44#2, U2, is faulty.	Same as for 40H .
84H	ASIP	Primary A44#1, U1, is faulty.	Same as for 40H .
82H	ASIP	The UART, U5, is faulty.	Same as for 40H .
81H	ASIP	The RAM, U8, is faulty.	Same as for 40H .

The failure codes produced by the firmware in response to the detection of a hardware fault are bit-significant as follows:

B7	B6	B5	B4	B3	B2	B1	B0
0	PSG	RTC	RAM	KEYS	c2*	c1*	c0*
1	ASIP	RS-232	A44#3	A44#2	A44#1	UART	RAM
* Refers to key's column number. Note: Bit 7 indicates whether the failure occurred on the user interface printed circuit card (UIP) (B7=0) or on the audio and system interface printed circuit card (ASIP) (B7=1).							

In most instances, the failure code accurately identifies the faulty hardware component. However, if the microprocessor is faulty, the readings may be unreliable or misleading.

Failure code A0H is always shown if the loopback test has not been performed. Refer to "Data Port" on page 37.

Attendant console features

Time and date

On the M2250 only, the time and date are automatically downloaded from the Meridian 1 on power-up or console reset.

To set the time and date locally on the M1250 attendant consoles, follow the procedures in Tables 5 and 6.

On the M2250 console, the time and date are downloaded by the switch whenever it runs a lamp audit. Only the visual format can be changed.

Table 5
Setting the time (M1250)

Step	Action	Response
1	Press the Shift key.	The Shift indicator goes on.
2	Press F1 to enter the Options menu.	
3	Select option 4 (set time).	The current time appears in the 24-hour format (hours: minutes: seconds).
4	To exit without changing the time, press the octothorpe (#) key.	
	To enter a new time, use the dial pad keys to overwrite the displayed settings.	When the new time is typed in, the cursor moves from position to position and then to the next entry field.
		If more than six digits are entered, the cursor returns to the hour field.
5	To put the new time setting into effect, press the asterisk (*) key.	After pressing the asterisk (*) key, the time entered is checked for correct (24-hour) format. If it is legal, the real-time clock changes to the setting entered; if it is illegal, the current real-time clock settings are redisplayed.
6	To exit, press the octothorpe (#) key.	

Table 6
Setting the date (M1250)

Step	Action	Response
1	Press the Shift key.	The current date appears in the day-month-year format.
2	Press F1 to enter the Options menu.	
3	Select option 5 (set date).	
4	To exit without changing the date, press the octothorpe (#) key. To enter a new date, use the dial pad keys to overwrite the displayed settings.	As in the new date is typed in, the cursor moves from position to position and then to the next entry field. If more than six digits are entered, the cursor returns to the day field.
5	To put the new date setting into effect, press the asterisk (*) key.	After pressing the asterisk (*) key, the date entered is checked for correct format. If the format is legal, the real-time clock changes to the setting entered; if it is illegal, the current real-time clock settings are re-displayed.
6	To exit, press the octothorpe (#) key.	

Trunk Group Busy indicators

Trunk Group Busy (TGB) indicators show the status of each group of trunks. If a TGB indicator is on steadily, the attendant has busied out all trunks in that group by pressing the Shift key plus the TGB key. If a TGB indicator is flashing, all the trunks in that group are actually busy.

In Supervisory mode, TGB indicators show the status of other consoles in the customer group. If the indicator is off, the attendant position is in a Position Busy mode. When an indicator associated with a particular attendant is on, the attendant is available to service calls.

Note: The M2250 attendant console must be equipped with the Attendant Supervisory Module (NT7G10AA) to allow attendant supervision.

Incoming Call Indicators

Incoming Call Indicators (ICIs) display the various types of incoming calls presented to the attendant console. They also indicate the number of calls, and the length of time calls have been queued.

- If the indicator is on, one call has been queued for less than a certain length of time (as defined by software).
- If the indicator is flashing, one call has been queued for more than the defined length of time, or there is more than one call in the queue.

Night service/busy

When the Shift key is off, pressing the Busy key puts the attendant console into Position Busy mode. When the Shift key is on, pressing the Busy key puts the console into Night Service mode. To return to normal operating mode, press the Busy key again.

In a multiconsole system, activating Night Service mode will busy out all attendant consoles in the system.

Enhanced Night Service

This feature allows Public Network (Central Office [CO], Direct Inward Dial [DID], Foreign Exchange [FEX], and Wide Area Telephone service [WAT]) trunks to be assigned to specific Directory Numbers (DN) during Night Service.

With this feature each customer will be able to assign Public Network trunks to one of nine Night Groups. Each Night Group will allow the customer to define up to nine Night DNs. During Night Service incoming calls will be routed to one of the Night DNs defined for the group. The actual DN the call will be routed to is determined by the Night Service Option number selected at that time.

The customer will also be able to define whether Night Call Waiting tone will be given to Night stations. With Night Call Waiting tone allowed, busy Night stations are notified when an incoming call is terminating on them. The incoming call will be queued on the Night station until it becomes idle. When the Night station becomes idle, the incoming call will be presented.

This enhancement allows incoming DID trunks to be queued against busy Night stations, thereby making the operation of the DID trunks the same as for all other Public Network trunks.

Attendant Blocking of DN

The Attendant Blocking of DN (ABDN) feature enables the attendant to block a DN for a telephone from receiving or making calls. This is particularly useful when a caller dials the attendant DN and requests an external (long distance) call. If the caller chooses to disconnect until the attendant successfully places the call, the requesting DN becomes idle and can receive or make calls. Therefore, the requesting DN could be busy when the attendant establishes the requested call.

To prevent the requesting DN from being busy when the requested call is completed, the attendant can block the DN from making or receiving calls. To callers attempting to contact the blocked DN, the line appears busy. To a caller attempting to use the blocked DN, the line is connected to the attendant.

When the attendant completes the external call, the attendant can call the blocked DN and extend the call. This feature applies to both stand-alone and ISDN network environments.

The Attendant Blocking of DN feature is available on the M2250 and M1250 attendant consoles. It is not valid on 2616 telephones used as attendants on Option 11 systems. It applies to the following systems: Meridian 1; Options 11C, 51C, 61C, and 81C.

Attendant and Network Wide Remote Call Forward

This modification to the Remote Call Forward feature (RCFW) allows a user to program a call forward Directory Number from any attendant console or station throughout the network. A new RFW key on the attendant console allows an attendant to view any station's call forward status and to activate or deactivate call forward for a station.

Refer to *Networking Features and Services* (553-2901-301) for further details.

Network Attendant Services

This feature allows attendant services to be distributed anywhere within a Meridian ISDN network. If, at the time of an attendant request, attendant services are not available at a station's local node, connection to an attendant at a remote node takes place. Call treatment is the same as for a connection to a local attendant node.

Call processing

The attendant answers an incoming call by pressing the flashing loop key.

To answer a specific type of incoming call, press the ICI key next to the appropriate ICI indicator. This removes the call from the queue and presents it to the attendant.

ICI key assignments

An ICI key may be assigned more than one call type. Refer to *Administration* (553-3001-311). If the Attendant Call Party Name Display (ACPND) feature is equipped, all incoming calls are displayed by calling party name or external call source. Examples of possible ICI key assignments and displays are given in the following listing.

- **Attendant Intercept** indicates that a call is being made by a station to a facility to which that station is restricted, and the call has been routed to the attendant console.
- **Listed Directory Numbers (maximum four)** indicates that a call is being made to an attendant console associated with one of the listed directory numbers.
- **Dial 0** indicates that a station that is not fully restricted has dialed 0.
- **Fully Restricted Station** indicates that a fully restricted station has dialed 0.
- **Foreign Exchange** indicates that the incoming call is from a foreign exchange.
- **Wide Area Telephone Service** indicates that the incoming call originated at a wide area telephone exchange.

- **Recall** indicates that a camped-on call or a call extended to an idle station has not been answered for 30 seconds or that a station is recalling the attendant.
- **Call Forward** indicates that the call is being forwarded to the console from a station within the system.
- **Tie Trunk** indicates that the incoming call is on a tie trunk.

Operating keys

The operating key/lamp strips CI/CK, DI, EI, and FI/FK allow the attendant to process calls from the console.

Key/lamp strips CI/CK and FI/FK have permanently assigned functions as given in the following list.

- **Release** allows the attendant to release a call presented to the console. When the LCD associated with the RLS key is lit, it indicates that no incoming calls are being presented to the console.
- **Loop Keys/Lamps** allow the attendant to answer and originate calls from the console. The first call in the incoming queue is automatically presented to an idle loop key. Subsequent calls are queued and presented to a loop key when a loop becomes idle. Call selection is made by pressing the required ICI key. This action causes the call, which was automatically presented to the loop key by the system, to be replaced by the selected incoming call. In all cases, when the loop key is pressed, all ICIs go dark except the one associated with the call presented to the loop key.
- **Position Busy** enables the attendant to put the console in Position Busy mode. All calls directed to a console in Position Busy mode are redirected to a free console in multiconsole installations or to the night connection in single console installations. When a console is in Position Busy mode, "BUSY" is shown on line 4 of the display.
- **Night Service** permits incoming calls to the attendant to be routed to a preselected station. The Night Service key enables the attendant to assign the Night Directory Number (DN) and to initiate Night Service. When assigning the Night Service DN, "NIGHT" flashes on line 4 of the display. When Night Service is on, "NIGHT" appears without flashing on the display.

- In a multiconsole system, activating Night Service will busy out all attendant consoles in the system.
- **Hold** allows the attendant to hold an active call at the console while serving other calls.
- **Conference** permits the attendant to set up a conference of up to five conferees plus the attendant.
- **Release Destination** allows the attendant to release the called party from a call held at the console while holding the calling party.
- **Release Source** allows the attendant to release the calling party from a call held at the console while holding the called party.
- **Signal Source and Destination** allows the operator to recall either party to a call held on the console.
- **Exclude Destination** excludes the called party from an established call held at the console, allowing the attendant to speak privately with the calling party.
- **Exclude Source** excludes the calling party from an established call held at the console, allowing the attendant to speak privately with the called party.

Feature keys

Any of the keys on keystrip FK can be assigned any of the optional features in the list that follows except the Barge-In and Busy Verify features. These require five LCD indicator states (off, on, and flash at 30, 60, or 120 impulses per minute). If Barge-In or Busy Verify is required, it must be assigned to keys FK-0 and FK-1.

All other features may be assigned to any of the keys on strip FK. Refer to *Administration* (553-3001-311) for additional information. The following are some of the more common feature keys:

- **Attendant End to End Signaling** enables the attendant to send dual tone multifrequency (DTMF) signals to either the source or destination party.
- **Busy Verify** allows the attendant to confirm that a station returning a busy signal is actually being used.

- **Barge-In** allows the attendant to enter an established trunk connection for the purpose of talking to one or both parties.
- **Paging** allows access to a public address facility.
- **Speed Call** allows numbers to be dialed automatically by pressing the SPEED CALL key and dialing a 1- or 2-digit code.

Call Waiting indicator

The Call Waiting indicator indicates that there is a queue of calls to be answered. When one or more calls are waiting, "CW" appears on line 4 of the display. The CW display changes from steady to flashing when waiting calls exceed a certain number or when a call has been waiting longer than a specified time.

The maximum number of waiting calls and the maximum hold time for each waiting call to be answered can be set with a data administration task. Refer to *Features and Services* (553-3001-306) for more information.

An optional buzz is available to indicate when the first call enters the queue. The number of waiting calls can be viewed on the LCD screen by pressing a key assigned on the attendant console. On the M2250, the number of waiting calls can be displayed continuously on line 4 of the display, if defined in LD15 and selected from the Options menu.

Alarm indicators

Alarms appear on line 4 of the display. "MN" indicates a minor alarm condition; "MJ" indicates a major alarm. A minor alarm is an indication of a minor system failure affecting a limited number of lines or trunks. A major alarm indicates that Emergency Transfer may have been initiated. See "Emergency Transfer" on page 53.

Emergency Transfer

If a major equipment or power failure halts local call processing, preselected CO trunks are automatically connected to preselected stations (predetermined and hard-wired at installation time) through relays in the Meridian 1. Emergency Transfer can also be activated manually by a switch underneath the attendant console.

If the switch is activated while the console has power, the word "EMERGENCY" appears on line 4 of the display.

Attendant Administration

Attendant Administration is an optional feature that allows the attendant to modify some of the features assigned to selected telephone sets within the attendant's customer group. The attendant can enter a special program mode with an assigned key.

Once in the program mode, the console key/lamp strips have different functions from those during normal call processing. A plastic overlay can be placed over the console keyboard to identify the altered key functions. Refer to *Features and Services* (553-3001-306) for Attendant Administration description and operating procedures.

Collect Call Blocking

The Collect Call Blocking feature enables a Meridian 1 administrator to block long distance collect call service calls on incoming Direct Inward Dialing (DID) and Public Exchange/Central Office trunks (analog or DT12).

Under the following conditions, the Meridian 1 sends a special answer signal to the Central Office to indicate that collect calls cannot be accepted:

- The Collect Call Blocking (CCB) package 290 is enabled
- The incoming route has CCB enabled via the CCB prompt in the Route Data Block
- The call is answered by a CCB user (i.e., Collect Call Blocking Allowed Class of Service or option)

New classes of service and prompts have been introduced to inhibit specific users from receiving collect DID and Central Office calls. These can be configured for the following:

- PBX and BCS through the Collect Call Blocking Allowed/Denied (CCBA/CCBD) option
- Attendant and Network Alternate Route Selection calls on a per customer basis through CCBA/CCBD option
- Automatic Call Distribution (ACD) queues through the CCBA prompt

- Direct Inward System Access (DISA) through the CCBA prompt
- Tandem calls dialed with Coordinated Dialing Plan (CDP) (Trunk Steering Code, Distant Steering Code) through the CCBA prompt
- Tandem non-CDP calls through the CCBA prompt in the Route Data Block from the outgoing trunk route

When a call is answered by a CCB user, the Meridian 1 sends the CCB answer signal in place of the regular signal for incoming DID/CO calls from the routes with CCB enabled. If the call is a collect call, The CO will disconnect the call.

Alarm Management

The Integrated Alarm Management feature is a series of subfeatures which improve the handling of key alarm messages generated by the Meridian 1 system and its Application Processors.

It also clarifies existing alarm messages and makes Attendant Console alarm lamp signals more meaningful. The Meridian 1 system has three levels of alarm: critical, major, and minor. The Attendant Console alarm lamp will light when critical alarms occur.

Digital Trunk Interface – CIS

The CIS DTI trunk feature provides connectivity between the Meridian 1 and digital trunks used in the Commonwealth of Independent States (CIS).

The CIS 2Mbps DTI feature is designed to allow the Meridian 1 to connect digital DID/COT trunks to a CIS Local Central Office and to a CIS Toll Exchange (through Local CO and Public Network, or directly for incoming toll call connections). This link supports DID/COT trunking types, and requires that the Meridian 1 be equipped with at least one CDT12/CSDT12 digital trunks pack, as well as associated software.

DPNSS Executive Intrusion

Executive Intrusion (EI) allows an originating party to break into an established call between two other parties (the wanted and the unwanted parties) under certain circumstances. If intrusion succeeds, a conference takes place on the wanted node between the originating, wanted and unwanted parties.

EI succeeds in breaking into the call based on comparisons between the Intrusion Capability Level (ICL) of the originating party and the Intrusion Protection levels (IPL) of the wanted and unwanted parties.

The Meridian 1 implementation provides Executive Intrusion from Attendant Consoles. Executive Intrusion from Telephone Sets is not supported. However, a Meridian 1 PBX will accept an EI activation request from an ordinary set on a third party PBX.

Attendant Monitor

Attendant Monitor is a customer-defined option which allows the attendant to monitor – in listen only mode – any established call involving a set or trunk on the customer with or without the connected parties being aware that monitoring is taking place (depends on the configuration of the new customer tone option).

The differences between the existing Busy Verify and Barge-in features and the Attendant Monitor feature are the following:

- Attendant Monitor provides a listen only path for the attendant.
- There is no click sound given to the connected parties upon Attendant connection when the no tone option is configured.
- The tone to the connected parties may or may not be given depending on the new customer tone options for Attendant Monitor.
- The display (if there is one) on any of the parties involved in the calls does not indicate that the Attendant is monitoring.

Busy Verify and Barge-in Enhancement

Attendant Monitor changes the operation of Busy Verify and Barge-in slightly. Tone is now configurable. Busy Verify and Barge-in restrictions relating to the Warning Tone Allowed/Denied class of service apply to Attendant Monitor as well.

Attendant Forward No Answer

Attendant Forward No Answer allows two enhancements to existing operations. The first enhancement permits calls presented to the attendant to forward to a second attendant or the night DN when a customer-defined time expires. The second enhancement allows DID or CO calls to any set during night service to disconnect if not answered within a predefined number of ring cycles.

Attendant Forward No Answer is selectable on a customer basis, and is included in the package 134, AFNA.

Semi-Automatic Camp-On

Semi-Automatic Camp-On is an option to the current camp-on operation. When the party to which a call is camped-on becomes free, the attendant is recalled first instead of the wanted party being rung immediately. The modification is implemented under the Semi-Automatic Camp-on (SACP) package.

When an external call is camped on to a busy DN by an attendant or a set, the called party receives a buzz (for SL1 sets) or a burst of tone (for 500/2500-type sets) indicating camp-on. Without SACP, if the called party becomes idle within a customer-defined time, the camped-on call rings the station immediately.

With SACP, if the called party becomes idle, the camped-on call recalls the attendant instead of ringing the called party. The called party meanwhile is kept busy from receiving any calls (but is still able to originate calls).

A new programmable key, the Semi-Automatic Camp-on Recall (SACP) key is introduced with the SACP feature. When a recall is presented to the console, the RECALL ICI lamp and the SACP lamp light up. After answering the recall from the calling party, the attendant can ring the called party by pressing the SACP key. The attendant can then hold the call on the console, or release the call as usual.

When the attendant tries to present the call (after it has recalled to the attendant) to the wanted party, this party may have originated another call. In that case, the attendant receives the indication that the set is busy, and can then camp-on the call again or release it, as usual. On a second camp-on, the attendant must activate the SACP feature again, if needed.

The SACP feature is active either for all camped-on calls or on a per-call basis depending on the customer option. When the per-call basis is chosen, the attendant activates the feature by pressing the SACP key before camping-on the call. If the SACP key is pressed twice, the associated lamp goes dark, and the SACP feature becomes inactive for the call.

Series Call

The Series Call feature causes a source call (either an attendant-answered incoming call, or an attendant-originated trunk call), that has been extended to an internal destination party, to be recalled to the attendant when the destination party hangs up. The attendant can then send the source call to another destination party. This feature enables a caller to talk to more than one party without having to disconnect and call again. Recall to Same Attendant must be allowed, otherwise the recall is routed to the first available attendant. This process can be repeated for as many destinations as requested by the caller.

A Series Call is canceled if one of the following occurs:

- the attendant presses the SECL key while the associated lamp is lit
- the attendant extends the source to a trunk while the SECL lamp is lit
- the attendant enters Night Service after extending the call and prior to receiving the recall
- the destination is call forwarded to a trunk
- the source disconnects

Powering and reset

After a power failure or a temporary corruption of data, the M1250/2250 attendant console is reset automatically.

If a permanent fault condition is detected, the console enters the maintenance mode (Position Busy), and a failure message is displayed on the LCD screen.

Note 1: The failure code format is XXH, where XX is a two-digit hex-code indicating where the fault has been detected. Refer to Tables 3 and 4 for explanations of the failure codes.

Note 2: When the BLF/CGM is attached to the console, an additional 16 V unregulated power source is required.

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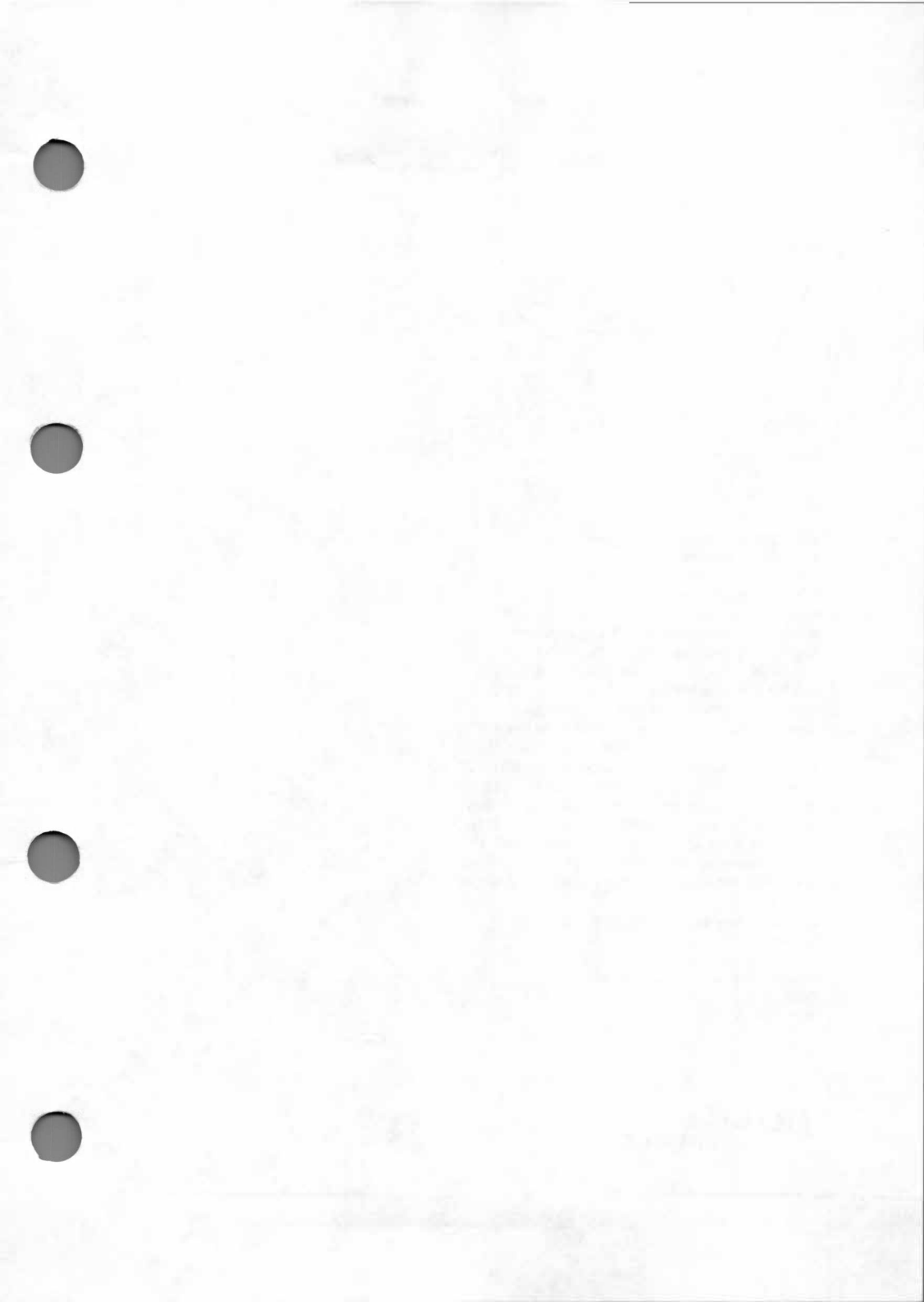
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Meridian 1

Attendant Consoles

Description

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NORTEL
NETWORKS™

Meridian 1

Meridian 1 Telephones

Description and Specifications

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About this document

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

This document provides feature, add-on module, and specification information for the following telephones and data options:

- M2000 Series Meridian Digital Telephones
- M2317 Telephone
- M3900 Series Meridian Digital Telephones
- MCA, MCU and ATA

For information on the i2004 Internet telephone, refer to *Internet Terminals: Description* (553-3001-217)

References

For more information, refer to the following documentation:

- *Digital Telephone Line Engineering* (553-2201-180)
- *Meridian Communications Unit and Meridian Communications Adapter: Description, Installation, Administration, Operation* (553-2731-109)
- *Spares Planning* (553-3001-153)
- *Equipment Identification* (553-3001-154)
- *Line Cards: Description* (553-3001-105)
- *Telephone and Attendant Console: Installation* (553-3001-215)

- *M3900 Series Meridian Digital Telephones: Description, Installation, and Administration (553-3001-216)*
- *Features and Services (553-3001-306)*
- *Administration (553-3001-311)*
- *Asynchronous Data User Guide*
- *M2317 Quick Reference Card*
- *Meridian Digital Telephones: M2006, M2008/M2008HF, M2616 User Guide*
- *M2216ACD Telephone User Guide*
- *Meridian Digital Telephones and Options: M2006, M2008/M2008HF, M2616, M2216ACD, M2016S Secure Set Quick Reference Guide*
- *Meridian Programmable Data Adapter User Guide*
- *Meridian Communications Adapter User Guide*
- *Installing the Analog Terminal Adapter*
- *Analog Terminal Adapter Quick Reference Card*

M2000 Series Meridian Digital Telephones

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This section contains information on the following topics:

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Reference list

The following are the references in this section:

- *Digital Telephone Line Engineering* (553-2201-180)
- *Equipment Identification* (553-3001-154)
- *Telephone and Attendant Console: Installation* (553-3001-215)
- *Features and Services* (553-3001-306)
- *Software Input/Output Guide Administration* (553-3001-311)

This chapter provides feature, add-on module, relocation, and specification information for the M2006, M2008, M2008HF, M2616, M2016S, and M2216ACD Meridian Digital Telephones.

Functional description

This section provides feature and software requirement information for the M2006, M2008, M2008HF, M2616, M2016S, and M2216ACD digital telephones.

Note: There are three distinct versions of M2000 Series Meridian Digital Telephones. All three versions are supported.

The versions can be clearly distinguished by the first four letters in the upper left-hand corner of the model identification label on the bottom of the telephone.

The three versions are the “NTZK” models, the “NT2K” models with date code prior to April 24, 1998; and the third version includes both the “NT9K” models and the “NT2K” models with date code of April 24, 1998 and later. In addition, the two jacks face in the same direction on “NT2K” and “NT9K” telephones, and in opposite directions on “NTZK” telephones. When appropriate, differences between the models are noted in this document.

M2000 Series Meridian Digital Telephones are designed to provide cost-effective integrated voice and data communication. These telephones communicate with the Meridian 1 using digital transmission over standard twisted-pair wiring. They interface with the Meridian 1 using the Integrated Services Digital Line Card (ISDLC), QPC578 or the Digital Line Card (DLC), (NTAD02.). No additional hardware is required at the line circuit to provide data communication.

M2000 Series Meridian Digital Telephones are connected to the system through a two-wire loop carrying two independent 64 kbs PCM channels with associated signaling channels. One of the two PCM channels is dedicated to voice; the other is dedicated to data traffic.

Line cords and handset cords on all M2000 Series Meridian Digital Telephones are equipped with standard modular connectors for easy and quick connecting procedures.

The telephone interfaces with the Digital Line Card (DLC) or ISDLC in the Peripheral Equipment (PE) shelf of the system. The DLC supports 16 voice and 16 data ports. The ISDLC supports eight voice and eight data ports. A TN is assigned to each port through the system software.

General features

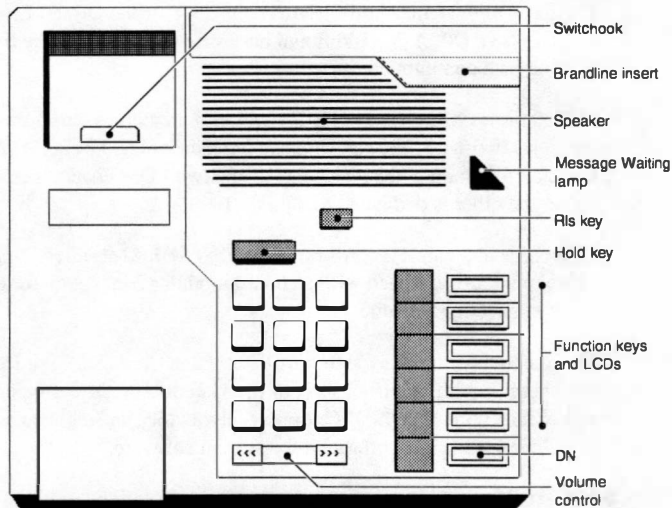
M2000 Series Meridian Digital Telephones have the following general features:

M2006 – a single-line telephone with six programmable function keys. See Figure 1 on page 14.

M2008/M2008HF – a multi-line telephone with eight programmable function keys. The M2008HF contains an integrated Handsfree unit. See Figure 2 on page 15.

M2616 – a high-performance multi-line telephone with 16 programmable function keys and integrated Handsfree unit. See Figure 3 on page 16.

Figure 1
M2006 telephone



Dimensions:

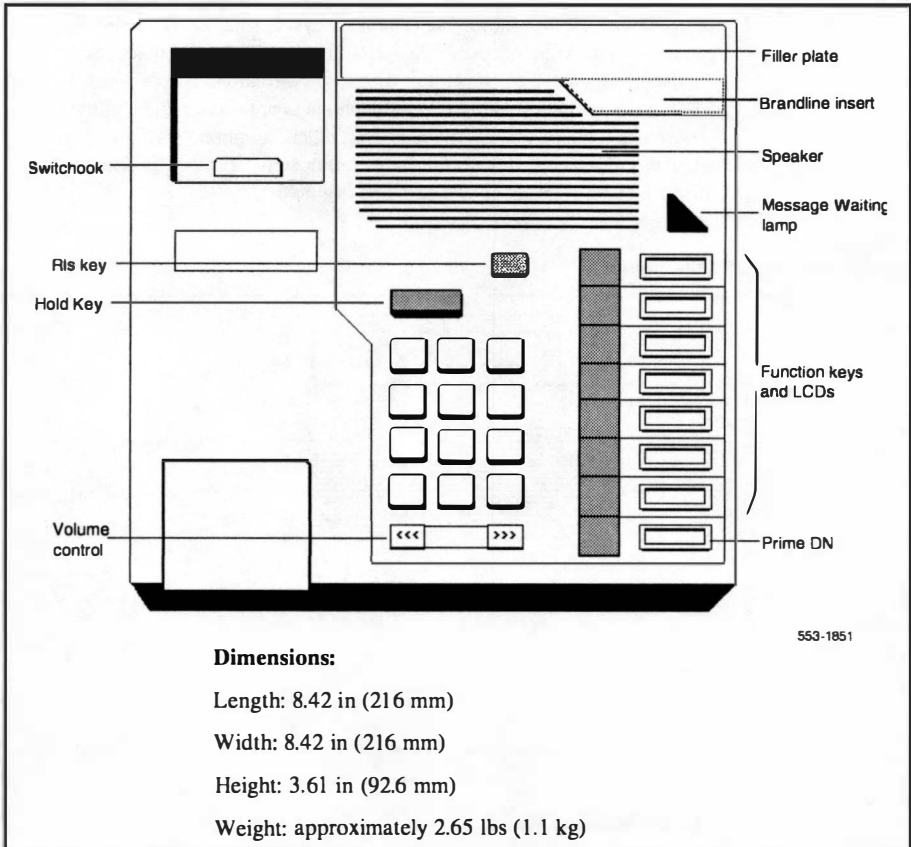
Length: 8.42 in (216 mm)

Width: 8.42 in (216 mm)

Height: 3.61 in (92.6 mm)

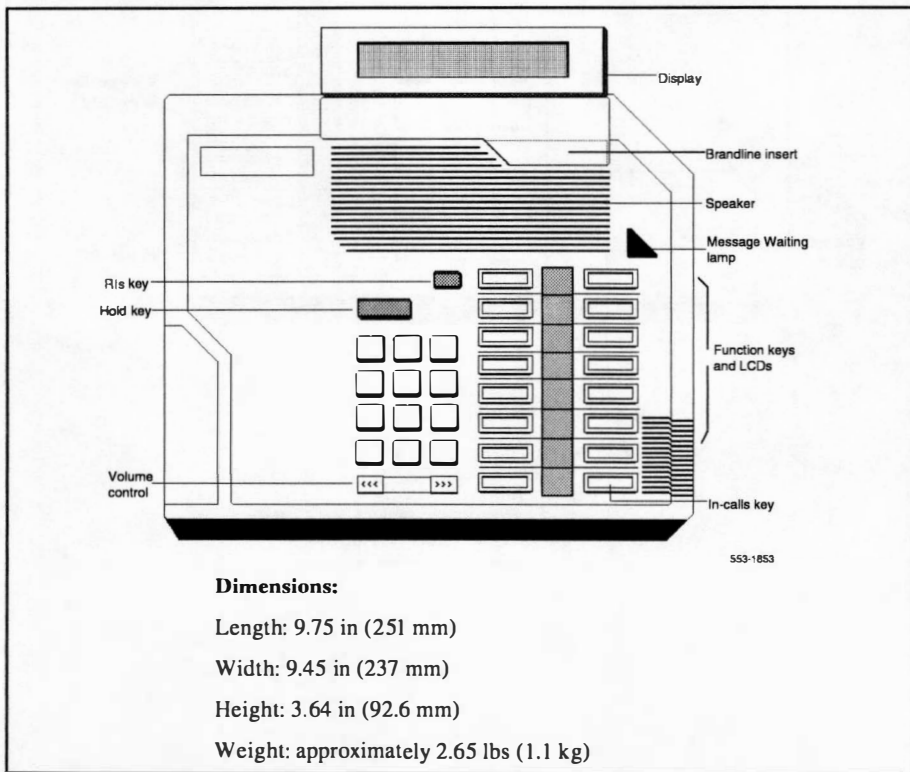
Weight: approximately 2.65 lbs (1.1 kg)

Figure 2
M2008/M2008HF telephone



M2016S – a secure telephone (Security Group Class II approved TSG-210291030), designed to provide on-hook security. It is similar to the M2616, with 16 programmable function keys, but has no Handsfree capability. The M2016S uses relay circuitry that physically disconnects the handset from the telephone circuit when the switchhook is depressed. The red LED triangle lights steadily when the phone is not secure. (The phone is not secure when the handset is off the hook, when the phone is ringing, or whenever the handset/piezo relays are connected.) The red LED triangle blinks when a message is waiting. See Figure 3.

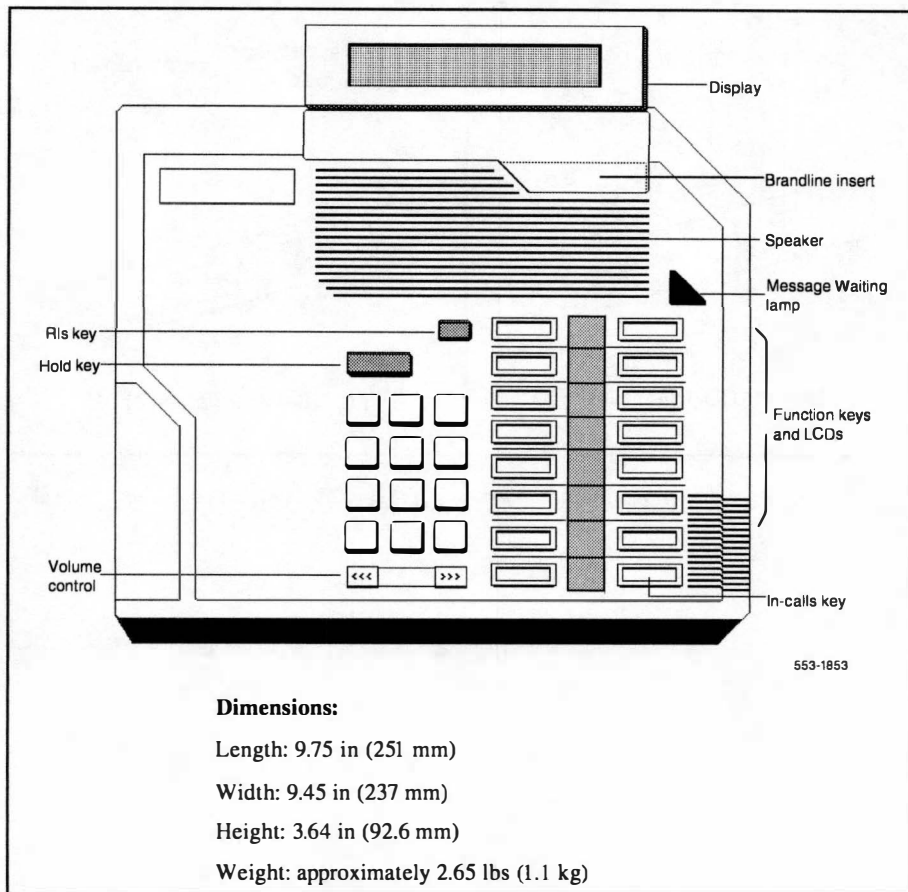
Figure 3
M2616 and M2016S telephones



M2216ACD-1 – a multi-line telephone for ACD operations See Figure 4.

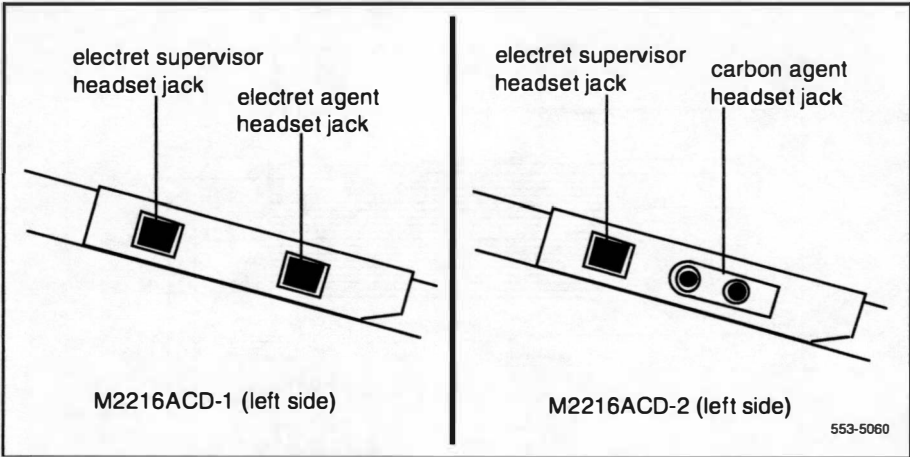
It has 15 programmable function keys, the Special Applications Display module, and two RJ-32 jacks for modular electret headsets. See Figure 5 on page 18.

Figure 4
M2216ACD-1 and -2 telephones



M2216ACD-2 (retired) – a multi-line telephone for ACD operations. It has 15 programmable function keys and the Display module. It is similar to model 1, but with one PJ-327 jack for a carbon agent headset and one RJ-32 jack for an electret supervisor headset. See Figure 5.

Figure 5
M2216ACD-1 and -2 left side showing headset jacks



Note: If headset is desired, the amplified type is strongly recommended.

M2216ACD Headset interface

Using the Program key, the headset/handset interface of the M2216ACD-1 can be adjusted to optimize performance.

The M2216ACD-1 is compatible with most headsets. Amplified headsets are strongly recommended. There are three settings:

- Interface 1 (i.e. Plantronics type)
- Interface 2 (Liberation)
- Interface 3 (Handset)

Note: Try using the headset with each of the three settings to determine which works best. Trial with both internal and external calls is also recommended to determine optimum performance.

Note: When the amplified headset is used, there are two choices for volume control:

- (1) the rocker control on the telephone
- (2) the switch on the headset

The settings which provide the clearest communication with the least amount of distortion are when the amplifier has a higher setting than the telephone volume control.

The supervisor and agent jacks are not interchangeable. A headset must be plugged into the agent jack if the telephone is to receive ACD calls.

Any recording device connected to the receive path of an M2000 Series Meridian Digital Telephone must meet these requirements:

- isolate power source from the headset/handset jack
- connect in parallel across pins 3 and 4 of the handset/headset jack
- load impedance at least 8K ohms across the audio band

Physical characteristics

Fixed keys

All of the M2000 Series Meridian Digital Telephones are equipped with the following fixed keys:

- Hold key
- Release key
- Volume control key

Volume control key

Pressing the right “volume up”* or left “volume down” side of the key increases or decreases the volume for the tone or sound that is currently active.

*All Meridian Digital Telephones, with the exception of the M2016S manufactured after June 1996 are compliant with the HAC volume level requirements issued by the FCC for handset volume control for the hearing impaired. The highest volume level setting provides 13.5 dB over nominal.

The volume levels are saved for subsequent calls until new volume adjustments are made. If the telephone is equipped with a Display module, volume can be adjusted at any time with the setting displayed on the screen (in Program mode).

The volume of the following tones can be changed while they are audible:

- ringing
- Handsfree (M2008HF/M2616)
- handset/headset
- buzz
- on-hook dialing

Note: If the telephone is disconnected, all volume levels will return to default values when reconnected.

Message Waiting lamp key

Each M2000 Series Meridian Digital Telephone has a red triangle in the upper right-hand corner that lights brightly to indicate a message is waiting. This LED is the primary message waiting indicator and indicates a message is waiting regardless of whether the telephone has a message waiting key/lamp pair. CLS Message Waiting Allowed must be enabled in LD 11. See *Software Input/Output Guide Administration* (553-3001-311).

If a message waiting key/lamp pair is assigned, there will be two indications of a message waiting:

- the red Message Waiting triangle lights
- the LCD associated with the Message Waiting key flashes

To avoid the double indication, assign an Autodial key that dials the message center (or voice mail system), or have no key/lamp pair assigned to the message center.

The Message Waiting lamp is also used to indicate security of the M2016S. The red LED triangle lights steadily when the phone is not secure. (The phone is not secure when the handset is off the hook, when the phone is ringing, or whenever the handset/piezo relays are connected.) The red LED triangle blinks when a message is waiting.

Handsfree/Mute key (M2008HF & M2616 only)

Handsfree can be software enabled on the M2008HF/M2616. This allows the user to talk to another party without lifting the handset.

Activate Handsfree by depressing the Handsfree/Mute key (key 15, top left for M2616; key 6, below Program for M2008HF) or by selecting a DN without lifting the handset. Once Handsfree is activated, it can be deactivated by picking up the handset or by ending the call using the Release (Rls) key. If Handsfree is not software enabled, another feature can be assigned to the "Handsfree" key.

Note: Software Control – CLS Class of Service for M2008HF

The Class of Service feature for M2616 Handsfree control allows system administrators to enable/disable the Handsfree option on the M2008HF (Handsfree) telephone through software. M2008HF telephones ship from the factory with a hardware jumper enabled to allow the Handsfree option for existing software releases.

Release 21.41 and later software will now override the hardware setting and default to Handsfree Denied (HFD.) If the handsfree option is desired, the system administrator simply enables Handsfree through the Class of Service prompt HFA included in LD 11 for the M2008 telephones (consistent with M2616).

Service Change Parameters

LD 11 – Allow/Deny Handsfree for M2008HF

Prompt	Response	Description
REQ:	New/Chg	
TYPE:	M2008	m2008 Digital Telephone
CLS	(HFD)	Digital Telephone Handsfree Denied
	HFA	Digital Telephone Handsfree Allowed

MAT

The Meridian M2008HF set is supported by providing a “Class of Service” change for LD 11 that allows handsfree operation on set type M2008. If MAT is equipped, a patch is required for MAT Release 4.02 to support this feature. Sites running MAT Release 3 cannot be patched to support this operation. Sites with MAT Release 3 must upgrade to MAT Release 4 and obtain a patch to support M2008 handsfree operation. The patch is available from ETAS.

Handsfree operates as if an off-hook operation had been performed. For example, when the telephone is idle, pressing the Handsfree/Mute key turns on the Handsfree and selects a DN (depending on line selection as assigned through COS), allowing the user to make a call. When a call comes in to an M2008HF/M2616 and the set is ringing, pressing the Handsfree/Mute key turns on the Handsfree and allows the user to answer the incoming call (depending on COS-assigned line selection) without picking up the handset.

Features keys

Each M2000 Series Meridian Digital Telephone has a number of programmable keys with LCD indicators that can be assigned to any combination of directory numbers and features (only one DN for the M2006). The lower right-hand key (key 0) is reserved for the Primary DN.

Note 1: When equipped with a Display module, Meridian Communications Adapter (MCA), or Meridian Programmable Data Adapter (MPDA), key 07 is automatically assigned as the Program key and cannot be changed. Key 05 becomes the Program key on the M2006 if equipped with the MCA or MPDA.

See "Data options" on page 75 for more information on the MCA and MPDA.

Note 2: The M2006 is a single-line telephone and accepts only one DN. The remaining five key/lamp pairs can be assigned any feature that is not considered a DN, such as Transfer, Call Forward, or Conference. Features that cannot be assigned are those that are considered DNs: Voice Call and two-way Hot Line, for example. Attempting to assign more than one DN to the M2006 causes the telephone to disable itself and all LCDs light steadily. It will return to its normal operating state when a service change removes all secondary DNs.

LCD indicators support four key/LCD states:

Function	LCD state
idle	off
active	on (steady)
ringing	flash (60 Hz)
hold	fast flash (120 Hz)

* An indicator fast flashes when a feature key is pressed but the procedure necessary to activate the feature has not been completed.

Data Options

See "Data options" on page 75 for more information on the MPDA and MCA.

Software requirements

The option number for the M2000 Series Meridian Digital Telephones is 170. The mnemonic is ARIE. DSET package 88 and TSET package 89 are required.

Modular options

This section describes the modular options available for M2000 Series Meridian Digital Telephones. Table 1 lists the features and optional hardware available for each telephone.

Table 1
Hardware features and options

	M2006	M2008/ M2008HF	M2616	M2016S	M2216 ACD-1	M2216 ACD-2
Programmable keys	6	8	16	16	15	15
Handsfree microphone		standard on the HF	standard			
Optional hardware available:						
Display		x	x		standard	standard
Key Expansion Module			x		x	x
Meridian Communications Adapter (MCA)	x	x	x		x	x
Meridian Programmable Data Adapter (MPDA)	x	x	x		x	x
External alerter interface	x	x	x		x	x
Note: In this table, x indicates available features for the telephone type listed in the top row.						

Table 1
Hardware features and options

	M2006	M2008/ M2008HF	M2616	M2016S	M2216 ACD-1	M2216 ACD-2
Analog Terminal Adapter (ATA)	x	x	x		x	x
Brandline insert	x	x	x	x	x	x
Note: In this table, x indicates available features for the telephone type listed in the top row.						

Note: If the telephone is equipped with a Display, Meridian Programmable Data Adapter, or Meridian Communications Adapter, the number of programmable keys is reduced by one, as key 07 (key 05 on M2006) automatically assumes the Program function.

For installation information, see *Telephone and Attendant Console: Installation* (553-3001-215). See "Data options" on page 75 for more information on the MPDA and MCA.

Display module

A two-line (24 characters per line) Display module provides system prompts, feedback on active features, and valuable calling party information. In addition, various telephone features can be modified, such as volume and screen contrast, using the Program key (top right function key). A Call Timer can be enabled, which times calls made or received on the prime DN.

Note: The display module is not supported on the M2006.

The displays previously available (NT2K24WA, NT2K25YL, and others) have been replaced by display NT2K28xx which eliminates a daughter board. Two new screens have also been added to support ACD applications:

- Logged Out
- Not Ready

Note: It is possible to adjust the Display screen contrast so that it is too light or too dark to read. If this happens, disconnect and then reconnect the line cord to return to the default settings.

Program key

The Program key is automatically assigned to M2000 Series Meridian Digital Telephones with Display, Meridian Communications Adapter (MCA), or Meridian Programmable Data Adapter (MPDA) added. A variety of display features can be changed, such as screen format, contrast, and language. It also permits changes to data parameters, such as transmission speed and parity, on the MPDA and MCA (if equipped).

The upper right-hand key (key 05 on the M2006 and key 07 on all others) automatically becomes the Program key when Display, MCA, or MPDA is configured with the telephone. The Program key is local to the telephone and shows blank when key assignments in LD 20 are printed.

See "Data options" on page 75 for descriptions of the MCA, MPDA and ATA and their requirements.

External Alserter interface

The External Alserter Board provides an interface to standard remote ringing devices, such as a ringing unit installed in a location separate from the telephone. The External Alserter interface is not the remote ringer itself, but provides access to standard, off-the-shelf remote ringing devices. The Alserter Board requires additional power. See "Power requirements" on page 31.

The External Alserter interface can be programmed to activate a ringer (or light) when the telephone rings or when the telephone is in use (off-hook).

For information on installing and setting up the External Alserter, see "Add-on modules" in *Telephone and Attendant Console: Installation* (553-3001-215).

Key Expansion Module

A modular 22-key unit can be attached to any 16-key M2000 Series Meridian Digital Telephone except M2016S. See Figure 6 on page 28. The extra keys can be assigned to any combination of lines and features. Up to two expansion modules can be added to 16-key telephones, providing a total of 60 line/feature keys. A separate footstand is needed for the module(s), one for a single module, one for a double. See "Ordering information" on page 39. The expansion module may require additional power. See "Power requirements" on page 31.

The Key Expansion Module connects to the telephone through a cable running from the base of the telephone. It is physically connected to the telephone by the footstand. NT2K22VH or later vintage key lamp modules are required for CISPR22, Class B compliance.

Brandline insert

The filler plate on the telephone or Display module contains a removable insert designed to accommodate custom labeling. Blank Brandline Inserts can be ordered, and a printer can silk screen a company logo on them. Brandline Inserts snap easily into and out of the filler plate.

M2006/M2008/M2008HF/M2216ACD/M2616 telephones

An electric headset can be used in the handset port of the M2006, M2008, M2008HF, M2616, and M2216ACD telephones. The amplifier must draw less than 400 micro amps from the telephone jack.

The headset should be designed to work with a telephone jack with these characteristics:

- Transmit interface: +5 V through 10K dc bias resistance with maximum current of 500 micro amps. The differential input impedance is 10K ohms. Connects to pins 2 and 5 of the handset jack.
- Receive interface: single ended output with output impedance of 180 ohms. Connects to pins 3 and 4 of the handset jack.

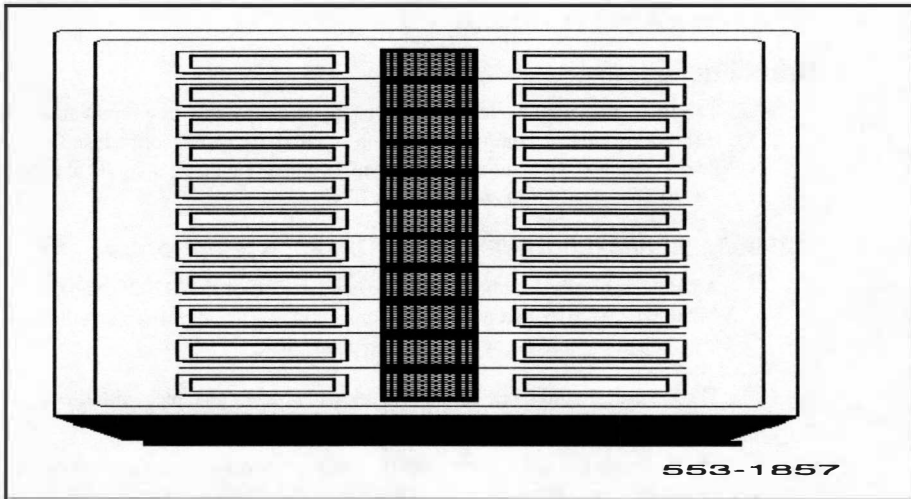
M2000 Series Meridian Digital Telephone relocation

This section describes how to relocate an M2000 Series Meridian Digital Telephone and its associated dataport Terminal Number (TN) without the intervention of a technician.

Modular Telephone Relocation is designed specifically for the M2000 Series Meridian Digital Telephones and is an enhancement to Automatic Set Relocation. If dataport TN information exists for the terminal, it is automatically relocated when the telephone is relocated.

When a telephone is relocated-out, a relocation block is built to store the relocation information in the protected data area. The relocation block includes the old TN, the terminal ID information, the serial number of the telephone, and other information.

Figure 6
M2616 with Display module and Key Expansion module



This feature uses the unique serial number and terminal ID of the M2000 Series Meridian Digital Telephone to identify the terminal being relocated and to reduce the number of manual steps needed for relocation.

See Automatic Set Relocation in *Features and Services* (553-3001-306) for complete details.

How to relocate an M2000 Series Meridian Digital Telephone

- 1** Go off-hook, receive dial tone, and enter Relocation Code (either SPRE +81 or Flexible Feature Code).
- 2** Enter optional security code as defined in LD 15 (a burst of tone confirms that the telephone is relocated-out).
- 3** Take it to the new location and plug it in (a confirmation buzz from the speaker indicates the telephone is in service).

Specifications

This section lists the specifications required for M2000 Series Meridian Digital Telephones.

Environmental and safety considerations

All digital telephones and their associated options meet the requirements of the Electronic Industries Association (EIA) specification PN-1361.

Temperature and humidity

Operating state:

Temperature range	0° to 50°C (32° to 104°F)
Relative humidity	5% to 95% (noncondensing). At temperatures above 34°C (93°F) relative humidity is limited to 53 mbar of water vapor pressure.

Storage:

Temperature range	-50° to 70°C (-58° to 158°F)
Relative humidity	5% to 95% (noncondensing). At temperatures above 34°C (93°F) relative humidity is limited to 53 mbar of water vapor pressure.

Electromagnetic interference

The radiated and conducted electromagnetic interference meets the requirements of Subpart J of Part 15 of the FCC rules for class A computing devices.

NT2K model sets with all options meet CISPR22, Class B requirements.

Local alerting tones

Each telephone provides four alerting tones and a buzz sound. The system controls the ringing cadence by sending tone-ON and tone-OFF messages to the telephone. The alerting tone cadences cannot be changed from the telephone but can be altered for individual M2000 Series Meridian Digital Telephones by software controlled adjustments in the system. See *Software Input/Output Guide Administration* (553-3001-311).

All other telephony tones, such as dial tone or overflow, are provided by the Meridian 1 from a Tone and Digit Switch.

Alerting tone characteristics

The tone frequency combinations are as follows:

Tone	Frequencies	Warble Rate (Hz)
1	667 Hz, 500 Hz	5.2
2	667 Hz, 500 Hz	2.6
M2006/M2008/M2008HF:		
3	1600 Hz, 2000 Hz	5.2
4	1600 Hz, 2000 Hz	2.6
M2016S/M2616/M2216ACD:		
3	333 Hz, 250 Hz	5.2
4	333 Hz, 250 Hz	2.6

A 500 Hz buzz signal is provided for incoming call notification while the receiver is off-hook.

Line engineering

M2000 Series Meridian Digital Telephones use twisted pair wiring on transmission lines selected by the rules given in *Digital Telephone Line Engineering* (553-2201-180). The maximum permissible loop length is 3500 ft. (1067 m), assuming 24 AWG (0.5 mm) standard twisted wire with no bridge taps. A 15.5 dB loss at 256 kHz defines the loop length limit. (Longer lengths are possible, depending on the wire's gauge and insulation.) Table 2 gives detailed information on loop lengths.

Table 2
Loop lengths for digital telephones

	QPC578 A and B	QPC578 C +	NT8D02
PVC insulated cable (polyvinyl chloride)			
22 or 24 AWG	100–3000 ft. (30.5–915 m)	0–3500 ft. (0–1067 m)	0–3500 ft. (0–1067 m)
26 AWG	100–2100 ft. (30.5–640 m)	0–2600 ft. (0–945 m)	0–2600 ft. (0–793 m)
Note 1: No bridge taps or loading coils are allowed.			
Note 2: Effect of line protector at MDF reduces loop length by 500 ft.			



CAUTION

**Damage to Equipment
Service Interruption**

Use only the line cord provided with the M2000 Series Meridian Digital Telephone. Using a cord designed for other digital telephones could result in damage to the cord/loss of set functionality.

Power requirements

The M2006, M2008, M2008HF, M2616 (basic configuration and with Display module), and M2216ACD-I are loop powered. Loop power, originating in the ISDL or the DLC, consists of a 30 V dc power source and assumes a 3500 ft. (1219 m) maximum loop length of 24 AWG (0.5 mm) wire and a minimum 15.5 V dc at the telephone terminals.

Note: The loop length limit is defined by a 15.5 dB loss at 256 KHz. Longer lengths can be determined using the wire's gauge and insulation.

The Handsfree feature, which is integrated into the M2008HF/M2616, requires no additional power.

Some configurations of telephones and options need more than basic loop power to operate. Table 3 on page 32 lists the types of M2000 Series Meridian Digital Telephones for NTZK telephones and Table 4 on page 33 lists the types for NT2K telephones. They show when additional power is needed to operate the telephone or its optional hardware. Power Supply Boards come installed in factory-assembled configurations that require additional power.

Note 1: If a power failure occurs, configurations that require loop power will continue to work only if the system has battery backup. Only those options that require additional power will cease to function.

Note 2: During a power failure, the carbon agent headset on the M2216ACD-2 will fail and the electret supervisor's jack can be used as an agent jack. If no headset is plugged in to the electret jack during power failure, the call is dropped, and the agent is logged off and must log in again once the electret headset is plugged in. When power is restored, the carbon jack returns automatically. Power supply board

Table 3
NTZK model Power requirements, M2000 Series Meridian Digital Telephone sets

Telephone type	Loop power	Additional power (Power Supply Board)
M2006	Basic configuration	MPDA, External Alerter Interface, MCA (optional),
M2008	Basic configuration	Any option(s)
M2616	Basic configuration (with Handsfree) and Display.	MPDA, Key Expansion Module, External Alerter Interface, MCA (optional)
M2016S	N/A	Basic Configuration
M2216ACD-1	Basic configuration (with Display)	MPDA, Key Expansion Module, External Alerter Interface, MCA (optional)
M2216ACD-2	N/A	Any configuration

The power supply option consists of a power supply board that mounts inside the telephone, coupled with an external wall-mount transformer or closet power supply that provides power to the power supply board. The power supply board receives its power through pins 1 and 6 of the line cord.

When installing an MCA or MPDA to NTZK or NT2K phone sets with a date code prior to January 1998, a Power Option board is required, along with an additional power source.

Table 4
NT2K model Power requirements, M2000 Series Meridian Digital Telephone sets

Telephone type	Loop power	Additional power (Power Supply Board and Transformer)
M2006	Basic configuration	Any option(s)* (MPDA, External Alerter Interface, MCA)
M2008/M2008HF	Basic and Display configurations	MPDA, External Alerter Interface
M2616	Basic, Display, and Handsfree configurations and Key Expansion Module(s)	MCA, MPDA, External Alerter Interface, MCA
M2016S	N/A	Basic configuration
M2216ACD	Basic configurations (with Display) Key Expansion Module(s).	MPDA, Key Expansion Module, External Alerter Interface, MCA
*No display can be added to the M2006 set.		

When installing an MCA in an NT9K phone set or an NT2K with date code of January 1998, only install the MCA (an additional Power Option board and Jumper board are not required).

The power supply board connects to the telephone through a 14-pin bottom entry connector.

Refer to Table 3 and Table 4 on page 33 for power supply board requirements.

Local plug-in transformer (A0367335)

A single winding transformer equipped with a 10 ft. (3 m) cord of 22 AWG two-conductor stranded and twisted wire with a modular RJ-11 duplex adapter can provide the additional power needed to operate the telephone and its options. See Figure 7 on page 35.

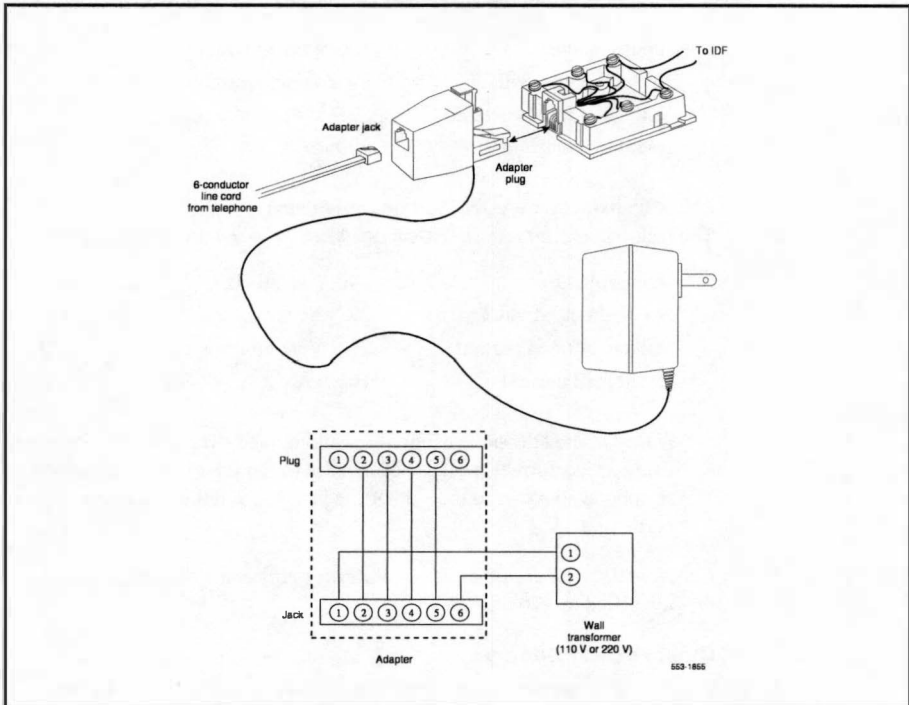


CAUTION

Damage to Equipment

Do not plug any equipment (computer, modem, or LAN card) other than the M2000 Series Meridian Digital Telephone into the RJ-11 transformer adapter, as damage to equipment may result.

Figure 7
Configuration of local plug-in transformer



120 V transformer (AO367335 or equivalent)

The following minimum specifications must be met by this transformer:

Input voltage	120 V ac/60 Hz
No load output voltage	29 V ac maximum
Voltage at rated current	26.7 V ac minimum
Rated load current	700 mA

240 V transformer (AO367914 or equivalent)

The following minimum specifications have to be met by this transformer:

Input voltage	240 V ac/50 Hz
No load output voltage	29 V ac maximum
Voltage at rated current	26.7 V ac minimum
Rated load current	700 mA

Note 1: The telephone cannot be wallmounted over the wall jack when using a transformer, because of the size of the RJ-11 adapter. Hang the telephone above or to the side of the jack and run the line and power cords to it.

Note 2: The above-mentioned transformers can also used with outlets identified as 110V or 220V.

Closet Power Supply

Closet power can be obtained from an ac transformer for loops of 100 ft. (30 m) or less, or a dc transformer for loop lengths of 650 ft. (198 m) or less. An equivalent power source can be used but must be UL listed to provide isolation of outputs to the terminal. See Figure 8 on page 37.



CAUTION
Damage to Equipment

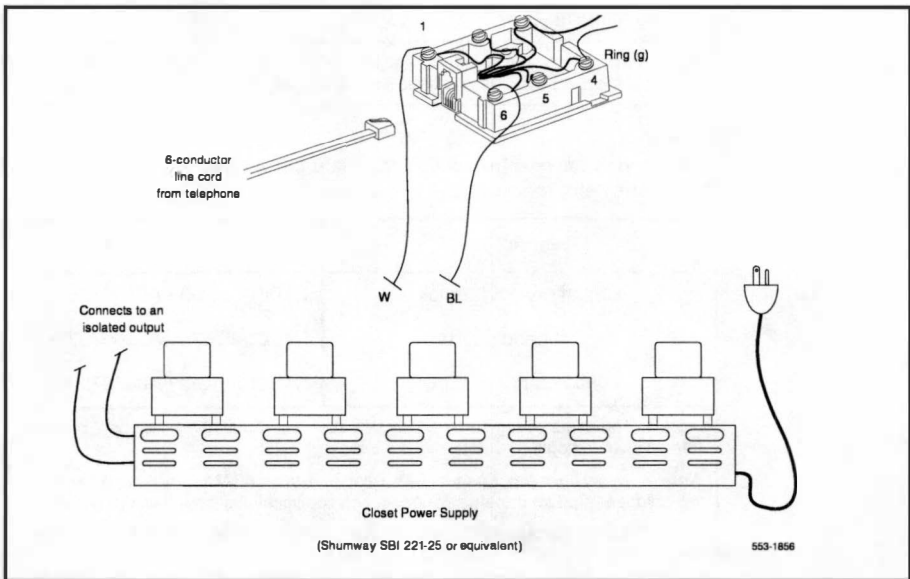
When using closet power, do not plug the modular connector into any equipment (computer, modem, or LAN card) other than the M2000 Series Meridian Digital Telephone, as damage to equipment may result.

Note 1: All terminals must be isolated from the input winding and each terminal must be isolated from all other terminal windings. A separate winding is required for each terminal, and grounds should not be connected.

Note 2: The QUT1 closet power supply source is not compatible with M2000 Series Meridian Digital Telephones.

The AC source should be rated at 29 V ac, 700 mA isolated. The dc source should be rated at 42 V dc, 300 mA isolated, with current limiting output of 1 amp.

Figure 8
Closet Power Supply configuration



Handsets

This section provides ordering information for M2000 Series Meridian Digital Telephone handsets.

Table 5
Order codes for new handsets for M2000 Series Meridian Digital Telephone sets, model NTZK

Description	Order Code
Legacy handset, Black	NT0C09EA03
Legacy handset, Ash	NT0C09EA35
Legacy handset, Gray	NT0C09EA93
Note: Handsets designed for NT2K sets (Global handset) will not meet product transmission/reception specifications if used with NTZK sets.	

Table 6
Order codes for new handsets for M2000 Series Meridian Digital Telephone sets, model NT2K

Description	Order Code
Global handset, Black	NT0C09EK03 / A0400786
Global handset, Ash	NT0C09EK35 / A0400787
Global handset, Gray	NT0C09EK93 / A0400790
Note 1: Handsets designed for NTZK sets (Legacy handset) will not meet product transmission/reception specifications if used with NT2K sets.	
Note 2: Noisy Location, Push-to-Talk, Push-to-Mute, and Mercury Switch handsets will not meet product transmission/reception specifications if used with NT2K sets.	
Note 3: Global handsets are not compatible with M1250 or M2250 (AE or current AF versions) telephones.	

Ordering information

Refer to the Nortel Networks price book, or contact your Nortel Networks representative for specific ordering codes.

Table 1, "Hardware features and options," on page 24 lists the hardware options that can be purchased separately.

For ordering configurations for M2000 Series Meridian Digital Telephones and accessories, see the current price book.

See *Equipment Identification* (553-3001-154) for more information.

M2317 Telephone

Contents

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Reference list

The following are the references in this section:

- *Digital Telephone Line Engineering* (553-2201-180)
- *M2317 Quick Reference Card*

Functional description

This section provides feature and software requirement information for the M2317.

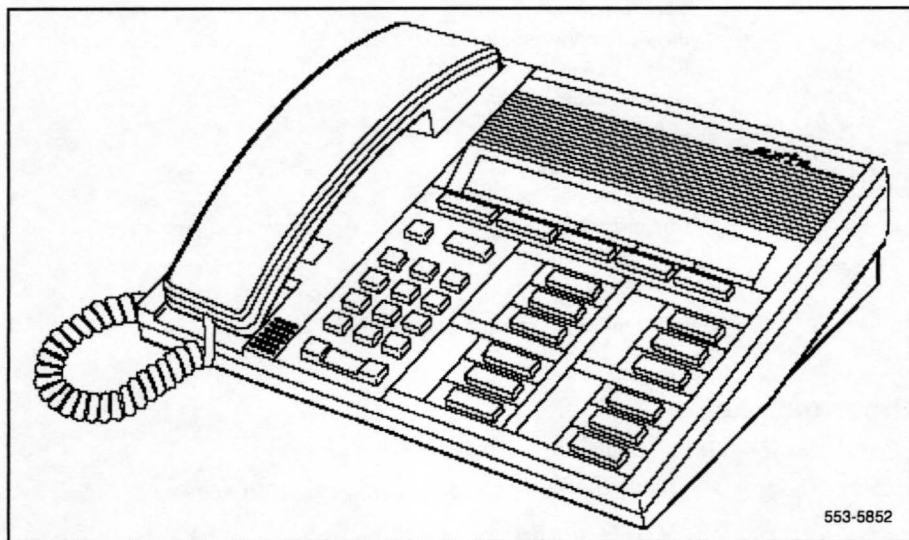
General features

The M2317 telephone has the following general features:

- A built-in, two-line (40 characters per line) Liquid Crystal Display (LCD) screen and integrated Handsfree.
- A telephone line cord and the handset cord equipped with standard modular connectors at each end, which permits quick replacement when required.

Figure 9 shows the M2317 telephone.

Figure 9
M2317 telephone



553-5852

Physical characteristics

The M2317 telephone has the following physical characteristics.

Housing

The housing of the M2317 digital telephone consists of a molded plastic base and faceplate. The display module and the main circuit board are fastened to the underside of the faceplate. The Asynchronous Data Option (ADO) circuit board, if equipped, is mounted inside the base.

Keys

The M2317 telephone is equipped with 17 feature keys. See Figure 10 on page 45.

Fixed keys

There are four keys to which a fixed function is assigned. They consist of the following:

- 1 Release key
- 1 Hold key
- 1 Volume control key (with 2 toggle positions)
- 1 Handsfree/Mute key (with associated LCD indicator)

Feature keys

There are 11 programmable line/feature keys on the telephone faceplate. Each has an associated LCD indicator. Lines and features are assigned to these keys by service changes in the system software. A maximum of ten voice Directory Numbers and specific features such as, Auto Answerback, Call Waiting, Dial Intercom, and Display can be assigned.

Alphanumeric display screen and softkeys

The M2317 telephone is equipped with a two-line (40 characters per line capacity) LCD screen and five LCD-labeled softkeys located immediately beneath the display screen.

The 155 x 15 mm (6 x 0.6 in) LCD screen has a capacity of 80 characters (two lines of 40 characters each). The first line displays date and time during the idle state, incoming call identification, feature icons, user prompts, and messages. The second line displays the labels for the softkeys (seven characters per key).

There are five softkeys. Count one to five from left to right. The fifth softkey “**more...**” is used to scroll to a second layer feature menu whenever there are more softkey-assigned features available for the active telephone state. Pressing the “**more...**” key will bring up the labels for the remaining functions. Softkey label positions on the display screen are fixed by the M2317 telephone firmware and cannot be changed by the user.

Each softkey has a seven-character-wide label on the display screen immediately above the key. The labels change as the available features change. For example, a softkey could access one feature in the idle state and a different feature in the active state.

Handsfree key

When Handsfree is on, a user can talk to another party without lifting the handset. Handsfree can be activated by pressing the Handsfree/Mute key, or by pressing a DN key without lifting the handset. The Handsfree/Mute LCD indicator shows the status of the Handsfree. Once Handsfree is activated, it can be deactivated by picking up the handset or by pressing the Release (RLS) key.

Handsfree operates as if an off-hook operation had been performed. For example, when the telephone is idle, pressing the Handsfree/Mute key turns on the Handsfree and selects a DN (depending on line selection as assigned through COS), allowing the user to make a call. When a call comes into an M2317 and the set is ringing, pressing the Handsfree/Mute key turns on the Handsfree and allows the user to answer the incoming (ringing) call (depending on COS-assigned line selection) without picking up the handset.

The M2317 provides independent volume adjustments for Handsfree, handset, and alerting tone volumes (on-hook dialing and buzz). For detailed information on adjusting the volume, refer to the *M2317 Quick Reference Card*.

LCD indicators

LCD indicators support the following four key/LCD states:

Function	LCD state
idle	off
active	on (steady)
ringing	flash (60 Hz)
hold	fast flash (120 Hz)

The following figures show the M2317 key layout and the different telephone states that can be displayed on the M2317 screen.

Figure 10
M2317 telephone – key identification

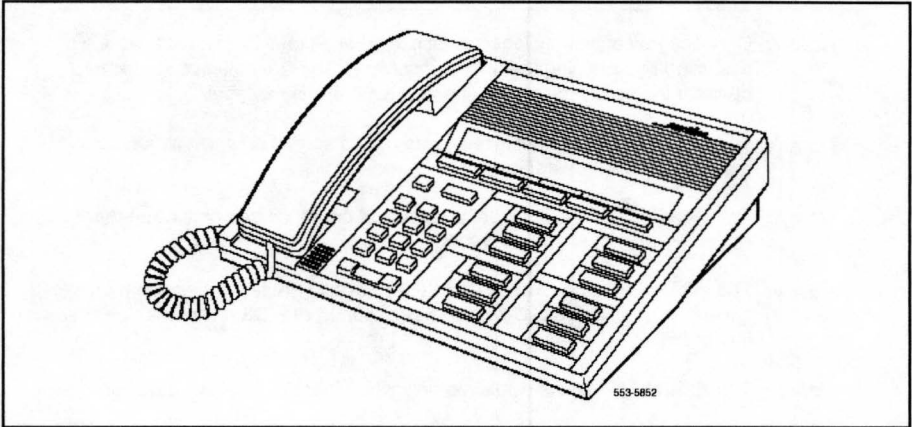


Figure 11
M2317 screen display – available idle state features

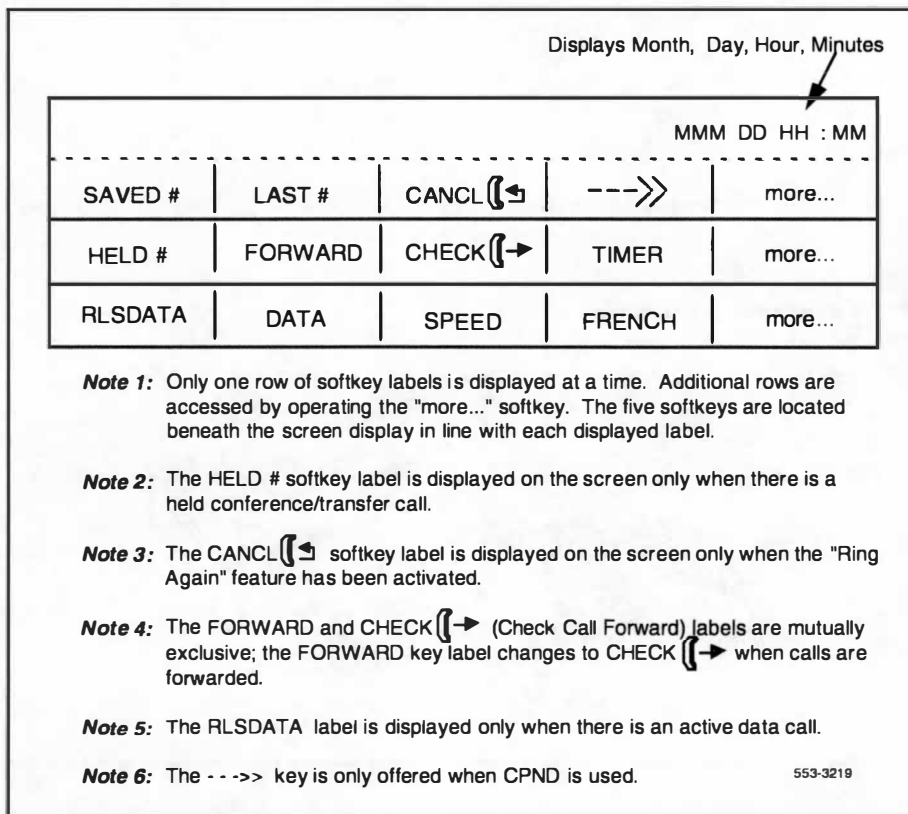


Figure 12
M2317 screen display – dial tone state

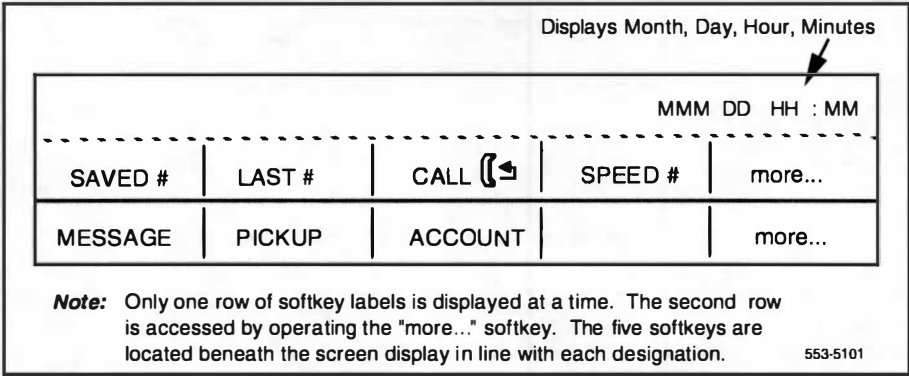


Figure 13
M2317 screen display – dialing state

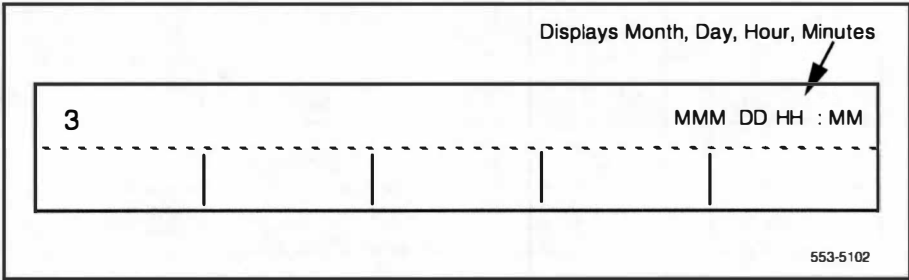


Figure 14
M2317 screen display – ringback state

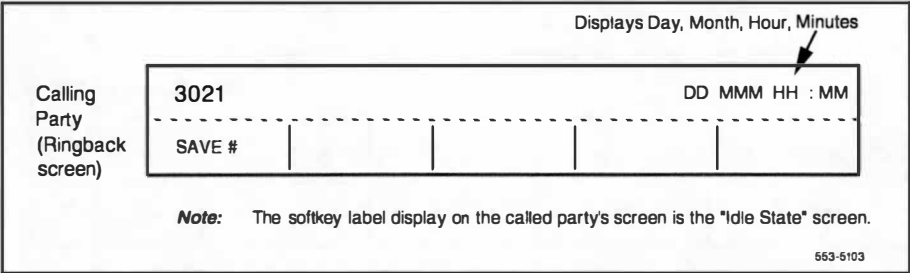
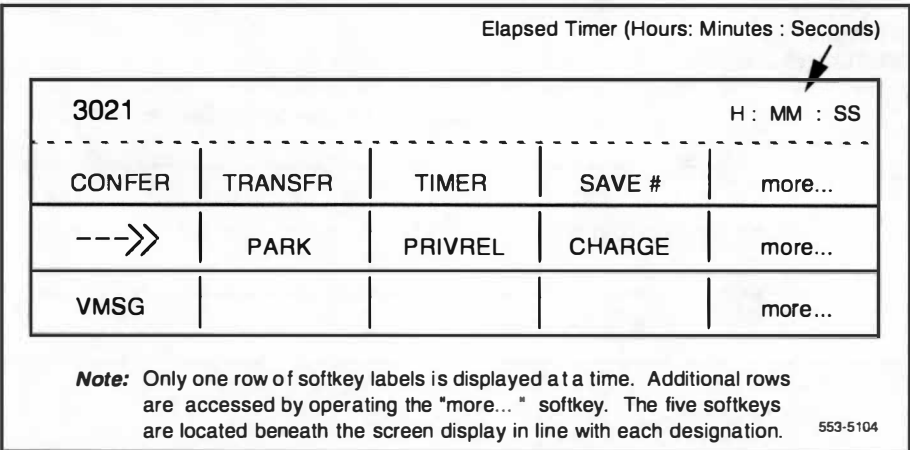


Figure 15
M2317 screen display – available established state features



Not all the features listed in Table 7 are provided for each customer. Check only those features that are enabled in accordance with the work order.

The -->> symbol display is associated with the Call Party Name Display (CPND) feature. CPND must be enabled before it can be accessed.

Table 7
M2317 states and associated softkeys (Part 1 of 3)

Screen state	State	Softkey display
Idle	On-hook, voice or data	Saved#, LAST#, CANCL  --->, more..., HELD#, FORWARD, CHECK  TIMER, more..., RLSDATA, DATA, SPEED
Dialtone	Ready to transmit dialed digits (voice)	Saved#, LAST#, CALL  SPEED#, more..., MESSAGE, PICKUP, ACCOUNT, more...
Intercom dialtone	Ready to transmit dialed digits for an intercom call (voice)	PICKUP
Dialing	Transmitting dialed digits	no softkeys shown
Private Line dialing	Transmitting dialed digits on a private line (voice)	SAVED#, LAST#
Busy	Called party off-hook (voice)	RINGAGN, SAVE#
Reorder	Called party is unavailable (voice)	no softkeys shown
Ringback	Called party is ringing (voice)	SAVE#
ERWT call back	Initial set of ESN routes not available. Set gets Expensive Route Warning Tone (voice).	RINGAGN, SAVE#
Established	Voice connection made	CONFER, TRANSFR, TIMER, SAVE#, more..., --->>, PARK, PRIVREL, CHARGE, more..., MESSAGE, more...

Table 7
M2317 states and associated softkeys (Part 2 of 3)

Screen state	State	Softkey display
Intercom established	Connection made with an intercom group (voice)	CONFER, TRANSFR, TIMER
Private Line established	Connection made with a private line (voice)	CONFER, TRANSFR, TIMER
Voice Call/Group Call established	Connection made using a voice key or group call key (voice)	no softkeys shown
Conference/Transfer dialtone	Special dialtone (voice)	SAVED#, LAST#, CALL SPEED, ACCOUNT 
Conference/Transfer dialing	After special dialtone is heard, dialing the call (voice)	no softkeys shown
Conference/Transfer busy	After special dialtone is received, called party is off-hook (voice)	RINGAGN, SAVE#
Conference/Transfer reorder	After special dialtone is received, called party is unavailable (voice)	no softkeys shown
Transfer ringback	Used xfer feature, and the called party is ringing (voice)	CONNECT, SAVE#
Conference ringback	Used conf feature, and the called party is ringing (voice)	SAVE#
Consultation	The third party (consulting party called by xfer/conf feature) has answered the call (voice)	CONNECT, SWAP
Consultation Hold	The user is talking to the original party and the consulting party is on hold (voice)	CONNECT, SWAP
Established Hold	Call held by other party (voice)	no softkeys shown
User status	Leave telset msg for set's status (voice)	no softkeys shown

Table 7
M2317 states and associated softkeys (Part 3 of 3)

Screen state	State	Softkey display
Display	The user has operated the feature key "DSP" to display the speed/system speed call numbers (voice or data)	SPEED#, EXIT
Program	User has operated a feature key that requires user-input such as Auto Dial or Controlled Class of Service (COS)	no softkeys shown
Data call initiation	User pressed data DN key to make a data call (data)	CALL  , SPEED#, SAVED#, LAST#
Data call dialing	Transmitting dialed digits (data)	no softkeys shown
Data call busy	Called party off-hook (data)	RINGAGN, SAVE#
Data call reorder	Called party is unavailable (data)	no softkeys shown
Data call ringback	Called party is ringing (data)	SAVE#
Data call ERWT call back	Initial set of routes not available. Set gets Expensive Route Warning Tone (ERWT).	RINGAGN, SAVE#
Data call established	Connection made (data)	SAVE#

Asynchronous Data Option

See "Data options" on page 75 for more information on ADO requirements.

Firmware features

Firmware is chip-dependent and cannot be changed or altered on site. As a general rule, all firmware is on ROM microchips. Firmware is built into the M2317 telephone and into the Meridian 1 system.

The following functions are performed by firmware in the M2317 digital telephone:

- Predial
- Last Number Redial
- Saved Number
- Redial Saved Number
- Timer
- Time and Date
- Call Processing

Software requirements

All information related to the programmable keys must be downloaded into the M2317 RAM memory through the DLC or ISDLC. Downloading to the telephone is performed when the system is loaded or when a telephone is enabled.

Softkeys are automatically defined for the telephone based on Class of Service (CLS), database, or package restrictions. Softkeys work only in conjunction with the LCD display screen.

Table 8 lists the data features supported by the M2317 firmware.

Table 8
M2317 data features

Data features	M2317	DTE Keyboard
Ring Again	X	X
Speed Call	X	X
System Speed Call	X	X
Display		X
Call Forward	X	
Call Transfer (Note 1)		X
Autodial	X	X
Last Number Redial	X	
Save Number	X	
Redial Saved Number	X	
Note 1: Manual modem pooling using keyboard dialing requires only call transfer to be defined.		
Note 2: The Data DN must always be assigned to feature key 10.		

Specifications

This section lists the specifications required for the M2317 telephone.

Safety considerations

The following safety procedures should be followed.

Shock and fire hazards

For protection against electrical shock, energy hazards, or fire hazards, the telephone meets the following specifications:

CSA, C22.2 No. 0.7 – M1985

UL 1459, relevant sections

Overvoltage protection

The M2317 telephone meets the specifications detailed by CSA, C22.2 No.7, paragraph 6.9.3.

Environmental considerations

The following environmental procedures should be followed.

Temperature and humidity

Operating state:

Temperature range	0° to 50° C (32° to 122°F) 0° to 40° C (32° to 104°F) with Data Option
Relative humidity	5% to 95% from 4° to 29°C (39° to 84° F) noncondensing 5% to 34% from 29.5° to 49°C (85° to 120°F) noncondensing

Storage:

Temperature range	–20° to 70° C (–4° to 158° F)
Relative humidity	5% to 95% from –20° to 29°C (–4° to 84°F) noncondensing 5% to 15% from 29.5°C to 66°C (85° to 150°F)

Dimensions and weight

The M2317 digital telephone has the following dimensions:

depth	226.5 mm (9 in)
width	272.0 mm (10.1 in)
height (front)	27.5 mm (1.1 in)
height (rear)	73.5 mm (2.9 in)

Excluding the power supply and the NT1F09AC Asynchronous Data Option board, the M2317 weighs approximately 1.4 Kg (3 lb). With the Data Option installed, the telephone, excluding power supply and data cable, weighs approximately 1.56 Kg (3.5 lb).

Line engineering

The M2317 digital telephones operate to their full potential through twisted pair wiring on transmission lines selected by the rules given in *Digital Telephone Line Engineering* (553-2201-180). The maximum permissible loop length is 1067 m (3500 ft.) of 22 or 24 AWG or 760 m (2500 ft.) of 26 AWG standard twisted wire with no bridge taps or load coils.

The 1067 m (3500 ft.) loop length requires the use of a Digital Line Card (DLC) or an Integrated Services Digital Line Card (ISDLC) QPC578, vintage C or later.

Power requirements

The M2317 digital telephone uses loop power for all circuits requiring +10 V. To satisfy the power requirements for those circuits on a maximum loop, as defined in *Digital Telephone Line Engineering* (553-2201-180), 60mA of 13.5 V dc must be available at the telephone. The line card must have compatible voltage and source resistance to meet these requirements.

Logic and other circuitry requiring +5 V is powered from an external, regulated +5 V dc supply when the data option is not installed. The external power supply must meet the following specifications:

Input:	95–129 V ac, 60 Hz
Output:	+5 V dc, + or –5%, 300 mA 10 mV maximum RMS ripple
Cord:	2.5 m (8 ft.) of 20 AWG wire mating to a Switchcraft 722A connector
Case:	Wall mounted, CSA and UL approved. Operational within 0°C (32°F) and 50°C (122°F) temperature limits
Impedance:	Greater than 10 M Ω to ground

The external power supply, in all cases where no Asynchronous Data Option is installed, is connected to the mating connector mounted in the rear of the M2317 telephone. It covers the area where the RS-232-C interface connector would be located.

Note: If the Asynchronous Data Option is installed, an external, multi-output data power supply is required. Refer to NPS50220-03L5. See “Data options” on page 75 for more information on ADO requirements.

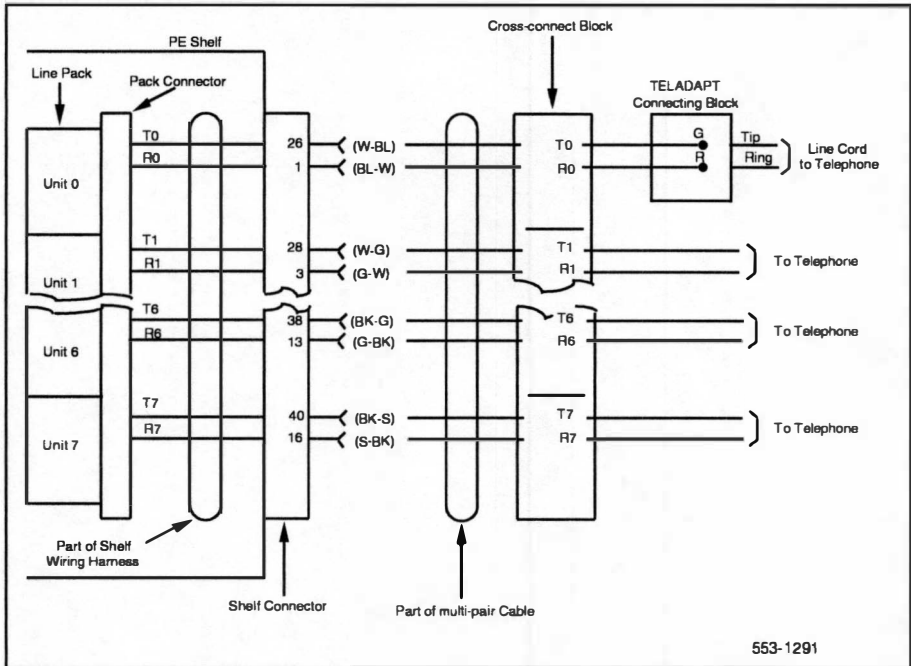
Ordering information for the M2317

Refer to the Nortel Networks price book or contact your Nortel Networks representative for specific ordering codes.

If the M2317 telephone fails to function properly, or if mechanical breakage occurs, do not attempt to make repairs in the field. Return the unit to the manufacturer.

Note: The NT1F09AA Synchronous Data Option must be release 4 or higher and requires the use of the multi-output Data Power Supply (A0336823).

Figure 16
M2317 telephone cross-connections



M2616CT Cordless Telephone

Contents

This section contains information on the following topics:

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Modular Options	66
Call Center	67
System Administration	67
M2616CT (Cordless Telephone) Battery	67
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Wall mounting the M2616CT	67
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Power requirements	68
Environmental considerations	69
Line engineering	72
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Reference list

The following are the references in this section:

- *Digital Telephone Line Engineering* (553-2201-180)

- *Software Input/Output Guide Administration (553-3001-311)*
- *M2616CT Cordless Telephone User Guide*

This chapter provides feature and specification information for the Meridian M2616CT cordless telephone.

Functional description

This section introduces the M2616CT cordless telephone. The M2616CT provides the user with mobility within the office environment. The M2616CT is an unlicensed 900 MHz single cell narrowband digital telephone. It supports 20 users within a maximum area of 50,000 square feet. The maximum range of the M2616CT from base to the register handset is 150 feet (45 m), depending on the phone's location. The following information is an overview of the base and handset units.

Physical characteristics

Keys

The M2616CT Cordless telephone is equipped with 17 feature keys which are arranged as follows:

Fixed keys

The fully integrated M2616CT base unit provides 13 programmable line/feature keys, plus a dedicated handset Locator, Volume control, Hold, Release, and Handsfree Mute and Program key. The handset has 6 programmable keys that corresponds to the 6 keys on the base unit (3 bottom keys on each side of the LED indicator).

There are six keys to which a fixed function is assigned. They consist of the following:

- 1 Release key
- 1 Hold key
- 1 Volume control key (with 2 toggle positions)
- 1 Program Key
- 1 Handsfree/Mute key (with associated LCD indicator)
- 1 Locator key

Volume control key

Volume is controlled by one key with two toggle positions. Press the "Volume Up" or "Volume Down" pad of the key to increase or decrease the volume for the tone or sound that is currently active.

To change the volume of the ringing sound, the user must press "Volume Up" or "Volume Down" while the ringing is heard. The volume settings are saved for subsequent calls until new volume adjustments are made.

Handsfree key

When Handsfree is on, a user can talk to another party without lifting the handset. Activate Handsfree by pressing the Handsfree/Mute key, or by pressing a DN key without lifting the handset. The Handsfree/Mute LCD indicator shows the status of the Handsfree. Once Handsfree is activated, it can be deactivated by picking up the handset or by pressing the Release (RLS) key.

The M2616CT provides independent volume adjustments for Handsfree, handset, and alerting tone volumes (on-hook dialing and buzz). For detailed adjusting information, refer to the *M2616CT Cordless Telephone User Guide*.

LCD indicators

LCD indicators support the following four key/LCD states:

Function	LCD state
idle	off
active	on (steady)
ringing	flash (60 Hz)
hold	fast flash (120 Hz)

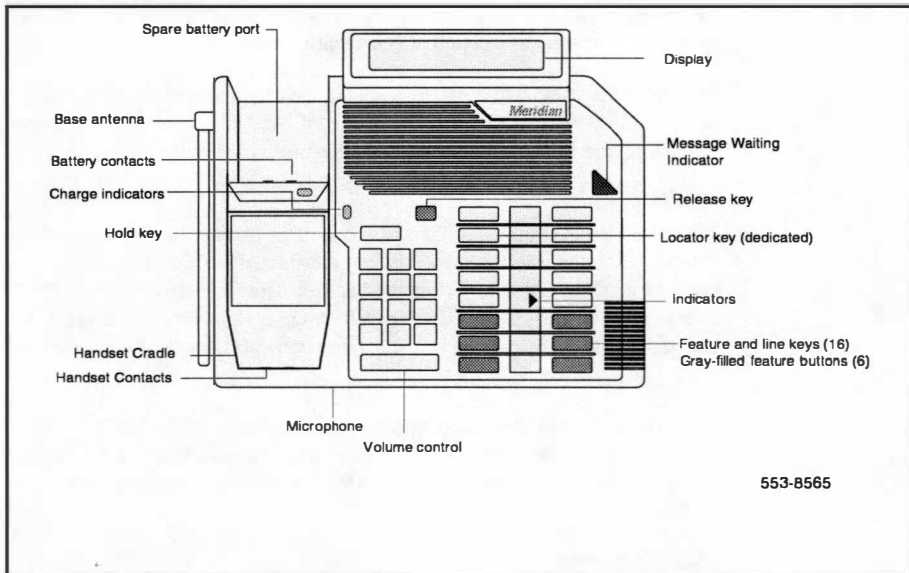
Housing

The housing of the M2616CT Cordless Telephone consists of a molded plastic base and faceplate. There is a display on both the base unit and the handset unit.

General features

The figures and figure shows the location of each control on the M2616CT and a brief description of the controls.

Figure 17
M2616CT Base Unit

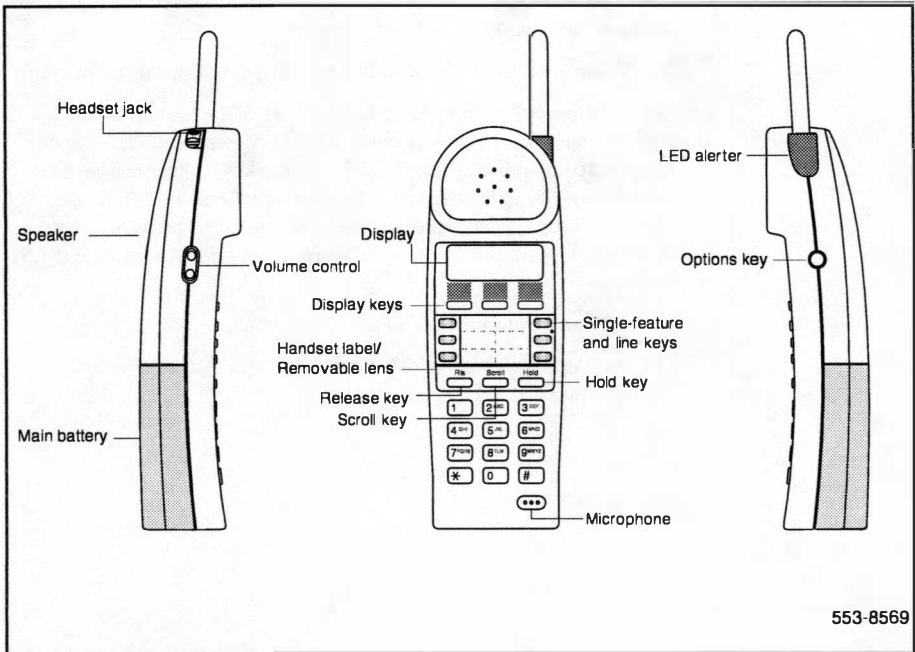


Base Unit Controls

- The **Base Display** is a two-lines, 24 characters display.
- The **Feature and line keys** access telephone features and lines. Six feature keys map to the handset feature keys. They are the three bottom keys, on either side of the light indicator LED strip.
- The **Handset cradle contacts** charges the cordless handset. The charge indicator light indicates the battery status of the handset. Green indicates the battery is fully charged.
- The **Charge indicator** lights indicate the status of the handset battery. Red indicates the handset is charging. Green indicates the battery is fully charged. The battery contacts, located on the upper half of the handset cradle, charges the optional spare battery.

- The **Diamond-shaped indicator light** appears beside active lines and features.
- The **Locator key**, locates the handset/manual Radio Frequency mode (if feature is assigned).
- The **Volume bar** controls the volume of the handset, speaker, and ringer.
- The **Microphone** enables handsfree calling. When Handsfree is on, a user can talk to another party without lifting the handset. Handsfree can be activated by pressing the Handsfree/Mute key, or by pressing a DN key without lifting the handset. The Handsfree/Mute LCD indicator shows the status of the Handsfree. Once Handsfree is activated, it can be deactivated by picking up the handset or by pressing the Release (RLS) key.
- The **Release key** terminates an active call.
- The **Message Waiting indicator light** indicates that a voice mail message has been left.

Figure 18
M2616CT Handset



Handset Controls

The handset Display is a two-line, 16 character display with a scroll button located between the Hold and the Release keys. The scroll key provides the extra 8 characters that map to the two-line, 24 character display on the base unit. An arrow on the display indicates when to use the scroll key to display additional text not shown on the display window.

The M2616CT displays an icon that indicates when the handset is out of range or when the battery is low. The display screen shows the time, date, call information and provides guides to various M2616CT features.

The **Display keys** show the prompts and Option list settings depending upon the state the handset is in. The prompts are displayed above each key. The lower line of the display screen is used to display instructions.

The **Message Waiting/Ringing Indication** is a red LED located on the base of the handset antenna that provides message-waiting indication and flashing visual ringing indication.

The **Handset labels** allow the feature keys to be personalized.

The **Headset jack** connects the detachable headset unit. Check with your Nortel Networks representative for authorized headset vendors.

The **Hold key** places an active call on hold.

The **Options key** allows changes to be made to the M2616CT settings in the Options list. The Options key is located on the right side of the M2616CT handset. Used with three display function keys, it lets users customize handset options, including the following:

- Speaker on/off – a speaker allows users to listen to voice mail or listen to a conference call without using the handset.
- Mute – microphone mute selection
- Ring Selection – allows users to select or change the ringing cycle

or

- Vibrate mode – vibrating notification instead of usual ringing cycle. A special vibrating battery must be purchased and installed in order to use this feature. Contact your local Nortel Networks distributor for the part number.
- Backlight (on/off) – lights the display when the handset is in use
- Base Lock/Unlock – allows the user to lock the M2616CT base unit to prevent others from accessing the base while the handset is in use.
- Ring Volume – adjusts the handset ringer volume
- Current Audio – resets the handset volume to the default setting
- Move Call Option – allows the user to conveniently move from a handsfree call on the base unit to the handset or move a call from the handset to handsfree on the base unit.

The **Release** key terminates an active call.

The **removable lens** protects the handset label.

The **Single-feature and line keys** allows one-touch dialing, feature operation or line access. These 6 keys corresponds to six of the single-feature keys on the base. The single-feature keys glow red to indicate when lines or features are active.

The **Scroll** key displays additional information in the display window.

The **Volume control** adjusts the volume for ring and alerter tones.

The **LED alerter** provides a visual ringing indicator and message-waiting indicator.

The **Speaker** permits a user to listen to voicemail or a conference call without holding the handset.

The Handset automatically goes into **Sleep Mode** when the handset is idle for more than 45 seconds. The handset can be “awakened” by pressing either a DN key, or the display key associated with the “Wake” function on the display.

Firmware features

The M2616CT utilizes the Digital Line Card, NT8D01xx for Meridian 1 Option 11 through 81C and MSL-100, and the Option 11C Compact Mini IPE 24 Port Digital Line Card, NTMW05AA.

System Software

The M2616CT is compatible with the following systems:

- Meridian 1 Option 11C through 81C
- Option 11C Compact running X27 and higher software

Modular Options

The following modular options are not supported on the M2616CT due to required placement of the RF circuitry within the telephone:

- Meridian Communications Adapter (MCA)

- Analog Terminal Adapter (ATA)
- Key Expansion Module(s)
- External Alert Interface

Call Center

The Meridian M2616CT does not support ACD features, and should not be programmed as a Call Center agent or supervisor.

System Administration

To configure the M2616CT (Cordless telephone) on the Meridian 1 system, refer to LD11 in *Software Input/Output Guide Administration* (553-3001-311).

For the Locator key (key 14) to function, do not assign a feature to this key.

Handsfree is required for the M2616CT to function properly.

M2616CT (Cordless Telephone) Battery

The M2616CT handset uses rechargeable 700 mAh and 1000 mAh Nickel-Cadmium batteries. Use only the battery identified or provided with this product. It should be charged according to the instructions and limitations specified in the *M2616CT Cordless Telephone User Guide*.

Handset Registration to Base Unit

Each M2616CT handset automatically registers with its respective base unit. In cases where a substitute handset is required for troubleshooting purposes, a different M2616CT handset can be re-registered by placing the different handset on-hook, and unplugging, then re-plugging in the base unit's ac power adapter and telephone line cord.

Wall mounting the M2616CT

The M2616CT base is equipped with a reversible footstand that allows the telephone to be mounted on the wall. For instructions, refer to the *M2616CT Cordless Telephone User Guide*.

Specifications

This section lists the specifications required for the M2616CT (Cordless Telephone).

Safety considerations

The following safety procedures should be followed.

Shock hazards

The telephone is not intended for direct connection to the public switched network or other exposed plant networks, because the exposed pins on the handset cradle (where the handset sits) creates a possible outlet for harmful voltage. The M2616CT is designed to be used with a Meridian PBX. Before installing the M2616CT, refer to *M2616CT Cordless Telephone User Guide*.

Use proper installation and charging procedures for the M2616CT battery pack to reduce risk of fire or personal injury.

Discard the battery if the battery is cracked or damaged. A damaged battery can leak electrolytes which are toxic if swallowed, are corrosive and can cause damage to the eyes and skin.

Do not short circuit the battery. Use care in handling batteries in order to not short the battery with conducting materials such as rings, bracelets, and keys. The battery or conductor may overheat and cause burns.

Power requirements

Both the M2616CT telephone and the M2018 telephone are loop powered. Loop power uses +15 V and -15 V sources and assumes 3500 feet maximum loop length of 24 AWG (0.5 mm) wire and a minimum of 13.5 V at the telephone terminals. The RF deck which powers the handset requires a wall transformer (Class 2 power supply Output rated at 7.5v dc).

The M2616CT handset uses rechargeable Nickel-Cadmium batteries. Both a 700 mAh and 1000 mAh battery, with or without a vibrate alerter, are available.

Battery charge time for the 700 mAh battery takes approximately 2.25 hours when attached to the handset, and provides approximately four hours continuous talk time if the handset backlight is turned on. If the handset backlight is turned off, up to five hours of continuous talk time is provided, depending on usage. Up to 72 hours of standby battery time is provided when the handset is off of the base unit.

The 1000 mAh battery takes up to 2.5 hours to charge when attached to the handset and provides approximately 5.5 hours continuous talk time, if the handset backlight is turned on. If the handset backlight is turned off, up to seven hours of continuous talk time is provided, depending on usage. Up to 86 hours of standby battery time is provided when the handset is off the base unit.

The batteries charge in both the handset and the base unit. The spare battery- charging port on the base unit provides a "trickle charge" that charges a battery at a slower rate than through the handset.

If the power supply fails, the optional spare battery in the spare battery charger will power the handset. Available talk-time depends on how much charge remains in the battery. The base phone continues to function without the handset in handsfree mode, even if the power supply fails and the spare battery is discharged or not available.

Environmental considerations

The following environmental procedures should be followed.

Environmental Performance

Depending on the environmental conditions, the range of the M2616CT can be reduced. Steel girders and concrete walls can limit the range of the cordless telephone. Line of sight conditions provide a maximum range of 150 feet. Some microwave towers and other products that sent out 900MHz frequencies can cause clipping when the handset is in use. The manual Radio Frequency (RF) channel selection, described on page 70, prevents interference with other 900 MHz devices.

The M2616CT uses 900 MHz narrowband technology to deliver digital RF signals from the M2616CT base to the handset. Twenty 900 MHz narrow band channels have been allocated to the handset. When the handset is lifted from the base the RF deck in the base scans the 20 channels for a clear channel to use. RF channels can also be manually selected using key 14 on the base.

Table 9
M2616CT Frequency Ranges

Channel/ Frequency		Channel/ Frequency		Channel/ Frequency	
CH00	902.6	CH06	912.0	CH13	919.6
CH01	904.0	CH07	914.2	CH14	921.4
CH02	905.6	CH08	914.8	CH15	921.4
CH03	907.2	CH09	915.2	CH16	923.0
CH04	908.8	CH10	915.8	CH17	924.8
CH05	910.6	CH11	916.4	CH18	926.4
CH06	912.0	CH12	918.4	CH19	927.6
CH07	914.2				

Range

Up to 20 M2616CT sets can be installed within a coverage area of approximately 50,000 square feet. The typical range of the M2616CT base unit to the cordless handset is between 125 feet to 150 feet. In open environments, additional coverage may be achieved.

If a user steps out of range during an active call, the M2616CT simply places the call on Hold, giving the user an opportunity to step back into range and conveniently resume the call by pressing the DN (Directory Number) key. Out-of-range indication on the handset display is also provided, whether the user is on an active call, or if the handset is idle.

Outside Plant

M2616CT is not intended for direct connection to the public switched network or other outside plant networks. The interface in the M2616CT is not suitable for direct connection to lines that exit the building, or connections to non-approved telecommunications products. Exposed contacts at the base of the M2616CT are directly connected to the line cord. Without proper protection, any foreign voltage from the line cord can be exposed to these contacts, and can cause personal injury.

Medical Facilities

The M2616CT is a 900MHz radio frequency telephone that may cause problems in medical facilities. Please advise when using this telephone and ensure that all safety precautions are followed.

Temperature and humidity**Operating state:**

Temperature range	0° to 50° C (32° to 122°F) 0° to 40° C (32° to 104°F) with Data Option
Relative humidity	5% to 95% from 4° to 29°C (39° to 84° F) noncondensing 5% to 34% from 29.5° to 49°C (85° to 120°F) noncondensing

Storage:

Temperature range	-20° to 70° C (-4° to 158° F)
Relative humidity	5% to 95% from -20° to 29°C (-4° to 84°F) noncondensing 5% to 15% from 29.5°C to 66°C (85° to 150°F)

Battery Disposal

Rechargeable Nickel-Cadmium batteries are recyclable. Recycle, or dispose of them properly.

- Discard the battery according to local ordinances.
- Do not discard the battery in office or household waste.
- Do not incinerate the battery as it may explode.

Line engineering

M2616CT telephones operate through twisted pair wiring on transmission lines selected by the rules given in *Digital Telephone Line Engineering* (553-2201-180). The maximum permissible loop length is 3500 ft. of 24 AWG (0.5 mm) standard twisted wire with no bridge taps.

Ordering information

Refer to the Nortel Networks price book or contact your Nortel Networks representative for specific ordering codes for the M2616CT (Cordless Telephone).

If the M2616CT fails to function properly, or if mechanical breakage occurs, do not attempt to make repairs in the field. Return the unit to the manufacturer.

M3900 Series Meridian Digital Telephones

The M3900 Series Meridian Digital Telephones provide versatile functionality to the desktop environment. The M3900 Series consists of five models:

- M3901 Entry Level Telephone
- M3902 Basic Telephone
- M3903 Enhanced Telephone
- M3904 Professional Telephone
- M3905 Call Center Telephone

For more information on the M3900 Series Meridian Digital Telephones refer to *M3900 Series Meridian Digital Telephones: Description, Installation, and Administration* (553-3001-216).

Data options

Contents

This section contains information on the following topics:

Asynchronous Data Option	76
Functional description	76
Meridian Communications Adapter	80
Functional description	80
Meridian Communications Unit	85
Functional description	85
Analog Terminal Adapter	86
Functional description	86

Reference list

The following are the references in this section:

- *Meridian Communications Unit and Meridian Communications Adapter: Description, Installation, Administration, Operation* (553-2731-109)
- *Transparent Data Networking* (553-2731-110)
- *Software Input/Output Guide Administration* (553-3001-311)
- *Asynchronous Data User Guide*
- *Analog Terminal Adapter Quick Reference Card*
- *Meridian Communications Adapter User Guide*
- *M2317 Quick Reference Card*

This chapter describes the Meridian Communications Adapter (MCA), the Meridian Programmable Data Adapter (MPDA), the Asynchronous Data Option (ADO), the Meridian Communication Unit (MCU), and the Analog Terminal Adapter (ATA). This chapter also describes several software features.

Asynchronous Data Option

The M2317 can be equipped with an Asynchronous Data Option (ADO) to allow a data call to be made using keyboard dialing from an attached terminal or personal computer. Voice and data communications can be conducted simultaneously without causing any mutual interference.

Functional description

The ADO is mounted in the telephone and works in conjunction with the Digital Interface Chip to provide asynchronous communication up to 19.2 kbps from an ASCII data terminal or a personal computer to the Meridian 1 Integrated Services Network. The ADO appears as Data Circuit-terminating Equipment (DCE) in the terminal and connects to the Data Terminal Equipment (DTE) through an RS-232-C connector mounted on the ADO printed circuit board.

The Asynchronous Data Option supports:

- Hayes dialing
- Automatic data rate detection at all rates up to 19.2 kbps
- ASCII keyboard dialing (originating data calls to local and remote hosts or DTE by using the terminal keyboard)
- Call origination to local and remote hosts
- Call termination
- Ring Again Capability
- Auto Dial
- Speed Call
- Automatic or Manual answering of incoming data calls
- Manual Modem pooling

- Remote loopback
- Break detection and generation

ADO operating parameters

Table 10 shows the operating parameters for the ADO.

Table 10**ADO operating parameters**

Data type	ASCII
Synchronization	Asynchronous, Start-Stop
Number of bits	8 bits
Parity	none (unchecked)
Data rate	300, 1200, 2400, 4800, 9600, 19200 bits per second (autobaud)
Stop bits	2 bits for 110 bits per second; 1 bit for all other speeds
Transmission	Full duplex

The ADO supports asynchronous ASCII operation. A data byte is received from the terminal or personal computer, a control byte is added, and the two bytes are transferred to the associated line card. In the other direction, two data bytes are received from the line card, the control byte is deleted, and the data byte is delivered to the terminal in a bit serial format, at the terminal's bit rate.

ADO external power supply

The ADO requires an external power supply in addition to the power from the line. See Table 11 on page 78. A 110 V ac 60 Hz, 100 V ac 50/60 Hz, or a 220 V ac 50 Hz multi-output power supply unit provides nominal voltages of +5 V, +12 V, and -12 V dc. The power supply connects to the back of the telephone through a 5-pin Molex power connector.

If the ac power supply fails, data calls cannot be processed. All external power supplies are equipped with short circuit and thermal shutdown protection.

Table 11 lists the input and output requirements for the ADO external power supply.

Table 11
I/O requirements for ADO external power supply (Part 1 of 2)

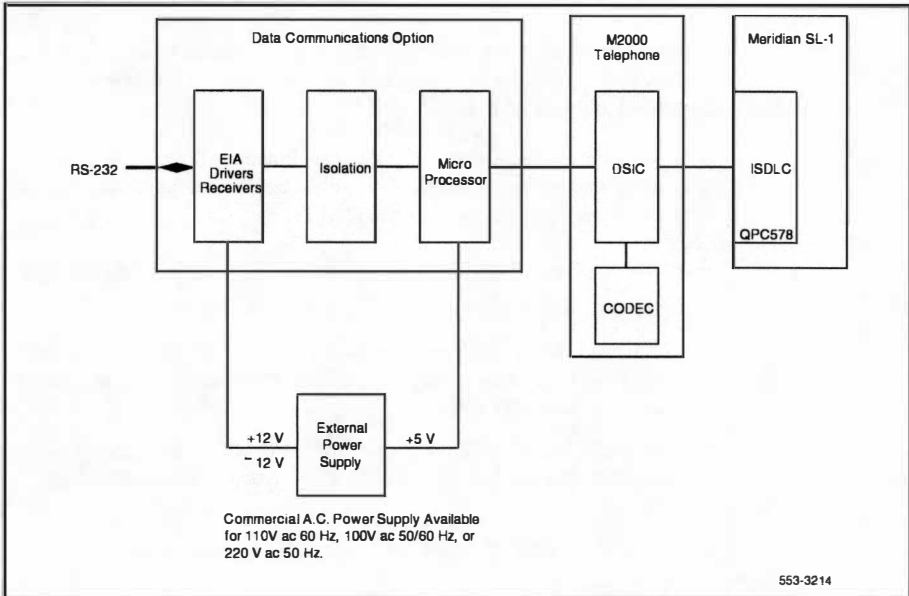
North American version	
NPS50220-03L5	Multi-output external power supply (A0336823), UL listed and CSA approved
Input:	57–63 Hz 115–132 V ac
Output:	+5 V dc, 1.0 A (pin 3 for supply, pin 2 for return) +12 V dc, 200 mA (pin 6 for supply, pin 1 for return) –12 V dc, 200 mA (pin 4 for supply, pin 1 for return)
Japanese version	
NPS50220-03L8	Multi-output external power supply (A0336891), Japan Standard ("T" Mark)
Input:	47–63 Hz 85–115 V ac
Output:	+5 V dc, 1.0 A (pin 3 for supply, pin 2 for return) +12 V dc, 200 mA (pin 6 for supply, pin 1 for return) –12 V dc, 200 mA (pin 4 for supply, pin 1 for return)
European version	
NPS50220-03L5	Multi-output external power supply (A0336166), conforming to NPS50561 general requirements and UL1012
Input:	57–63 Hz 200–240 V ac

Table 11
I/O requirements for ADO external power supply (Part 2 of 2)

Output:	+5 V dc, 1.0 A (pin 3 for supply, pin 2 for return)
	+12 V dc, 200 mA (pin 6 for supply, pin 1 for return)
	-12 V dc, 200 mA (pin 4 for supply, pin 1 for return)

Figure 19 shows a block diagram of the ADO and M2317 telephone.

Figure 19
Block diagram of ADO and M2317 telephone



See the *Asynchronous Data User Guide* and the *M2317 Quick Reference Card*, for more information on ADO operation.

Meridian Communications Adapter

The Meridian Communications Adapter (MCA) replaced the Meridian Programmable Data Adapter (MPDA), and offers enhanced capability over the MPDA. An MCA can be configured as an MPDA for use with releases earlier than Release 18.

Functional description

The MCA mounts within the telephone. It allows synchronous and asynchronous ASCII terminals, and personal computers to be connected to the telephone using an RS-232-C or V.35 interface on a DB-25 connector. See Figure 3 on page 16.

With release 14 and later, the MCA allows synchronous applications (DTEs such as video conferencing equipment and Group IV fax units) to be connected to the telephone.

Releases 14 through 17 allow access to data functions through the keypad only. However, release 18 and later allow access to data functions through both the keypad and service change in LD 11.

Asynchronous mode features supported by the MCA include the following:

- Asynchronous transmission at up to 19.2 kbps (autobaud)
- Enhanced Hayes commands, including upper- and lower-case dialing, voice call origination through AT dialing, hang-up data call, and on-line disconnect of voice call
- Script file capability that allows the MCA to learn a dial-up and log on sequence that can be played back to automatically access a host or service
- Voice Call Origination (VCO)
- DCE mode
- Autodial
- Ring Again
- Speed Call
- Autobaud and Autoparity Detect

- Modem Pool Calling
- Host/Terminal Mode
- Forced Data Terminal Ready (DTR)
- Dynamic Carrier Detect (DCD)
- Inactivity Time-out
- Remote Loopback
- RTS/CTS hardware flow control capability (when calling another MCA)

Synchronous mode features supported by the MCA include the following:

- Half Duplex/Full Duplex
- Internal and external clocking
- Modem and network capability
- Synchronous transmission up to 64 kbps
- Public Switched Data Services compatibility. MCA extends PSDS and 64K restricted and 64K clear capabilities to Modular telephones.
- V.25 bis dialing protocol support at all synchronous speeds up to 64 kbps. High-Level Data Link Control (HDLC) and Bisynch (character oriented) framing of the V.25 commands is supported.
- Programmable echo canceller disabling for 56 and 64 kbps network calls

Synchronous *and* asynchronous mode features supported by the MCA include the following:

- T-Link and DM-DM support
- T-Link and DM-DM are Nortel Networks proprietary protocols. The SL-100 and DMS data devices use T-Link. DM-DM is used by Meridian 1 data devices such as ASIM, AIM, ADM, SADM, Asynchronous Data Option (ADO), and MPDA. MCA can use both DM-DM and T-Link.
- Hotline
- Virtual Leased Line
- V.35 interface capability selectable with jumper plugs on the MCA

- Data tandem calls across TIE trunks, provided all switches involved are Nortel Networks machines
- PSDS tandem data calls across TIE trunks are supported with release 18 or later when each tandem node uses an ISDN Primary Rate Interface (PRI) or Basic Rate Interface (BRI) connection. See *Transparent Data Networking* (553-2731-110) for more information.

Note: Internal PSDS calls are not supported.

MCA operating parameters

The MCA data parameters are stored locally, although the configuration is set in the Meridian 1 system. Data parameters may not be set in the system before installing the MCA in the telephone. If the parameters are set before the telephone is installed, the configuration information will be lost.

Operating parameters are downloaded after the MCA is enabled in LD 11. With release 18 and later, system parameters are downloaded when the MCA is configured in LD 11, and power is reset. See the *Software Input/Output Guide Administration* (553-3001-311) for prompt and response details.

Data parameters can also be set, with release 18 and later software, through LD 11, as well as by the keypad.

The MCA communicates with Data Terminal Equipment (DTE) using the operating parameters shown in Table 12.

Table 12
MCA operating parameters

Synchronization	Asynchronous, Start-Stop
Number of bits	8 bits
Parity	none (unchecked)
Data rate	110, 150, 300, 1200, 2400, 4800, 9600, 19200 bits per second (autobaud) asynchronous up to 64000 bits per second synchronous
Stop bits	2 bits for 110 bits per second; 1 bit for all other speeds (asynchronous only)
Transmission	Half duplex; full duplex

When installing an MCA or MPDA into NTZK or NT2K phone sets with a date code prior to January 1998, a Power Option board is required, along with an additional power source.

When installing an MCA in an NT9K or NT2K phone set with date code of January 1998 or later, only install the MCA. An additional Power Option board and Jumper board is not required. See the specifications section of Chapter 4 for power requirements information.

Figure 20 on page 84 shows the back of a Modular telephone with an MCA mounted; Figure 21 on page 84 shows a block diagram of the Modular telephone and MCA.

See the *Meridian Communications Adapter User Guide* for more information on MCA operation. Also see "Ordering information" on page 39 for MCA ordering information.

Figure 20
Back of telephone showing MCA

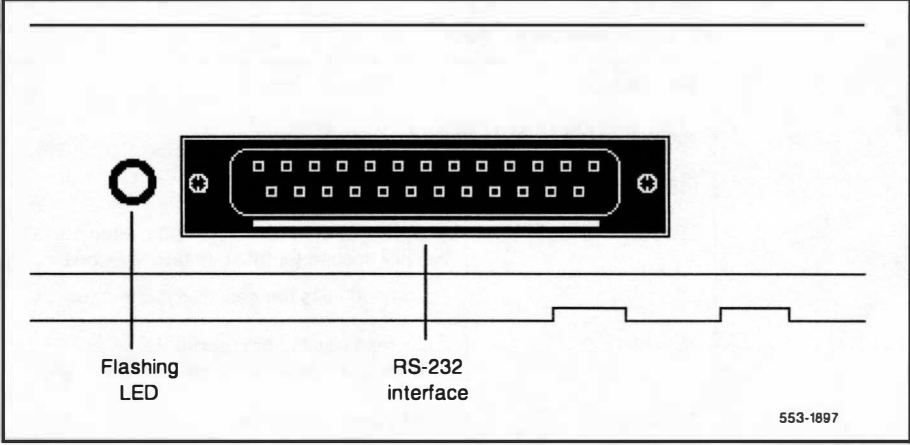
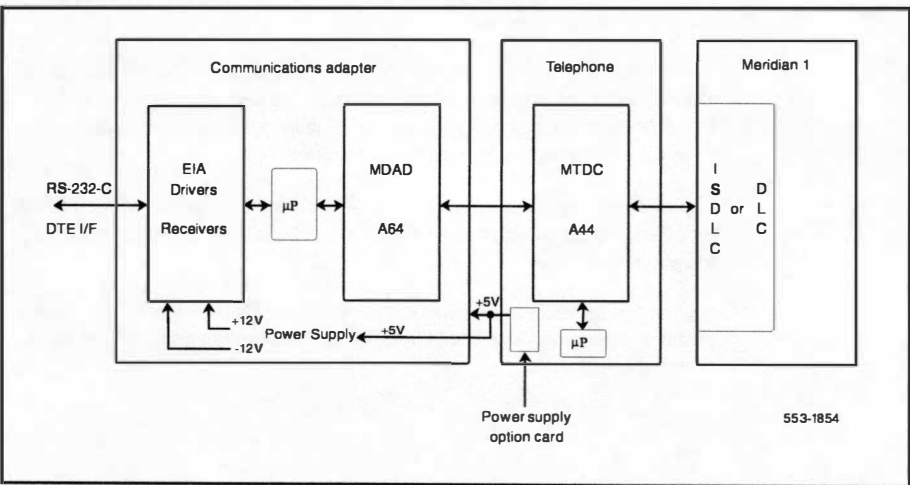


Figure 21
Block diagram of MCA and Modular telephone



Meridian Communications Unit

The Meridian Communications Unit (MCU) provides a stand-alone version of the Meridian Communications Adapter (MCA).

Functional description

The Meridian Communications Unit (MCU) allows data to be transmitted and received using PSDS, over either the public network or a private network.

The MCU, which replaced the QMT21C, is designed for domestic and international use, with transmission speeds up to 19.2 kbps asynch and 64 kbps synch, integrated display, and self diagnostics.

The MCU supports autodialing, ring again, and speed calling, as well as autobauding and automatic parity detection. The MCU can be used for the following:

- Video conferencing
- LAN bridging
- Bulk data/PC file transfer
- Dial back-up
- Host connectivity

The MCU fully complies with RS-232C and can be configured as DCE or DTE to connect to a terminal, printer, or fax machine.

Unlike the MCA, the MCU provides a dedicated call key and call progress tones. The MCU also permits smart modem pooling.

The MCU supports the DM-DM, T-Link, V.25 bis, and PSDS interfaces as well as the RS-232C, CCITT V.35, CCITT V.24, and RS570/RS3449 (with different cables) interfaces. It complies with V.28 for European approval.

Refer to *Meridian Communications Unit and Meridian Communications Adapter: Description, Installation, Administration, Operation* (553-2731-109) for detailed information on this feature.

Analog Terminal Adapter

The Analog Terminal Adapter (ATA) allows the use of an off-the-shelf analog device (FAX, Modem, Telephone) to operate simultaneously with the Meridian Digital Telephone set. The Analog Terminal Adapter board fits into the footstand space of the Meridian Digital Telephone set.

Functional description

The Analog Terminal Adapter is mounted in the footstand of the Meridian Digital Telephone set. The ATA requires a separate ac adapter which provides a 24 V ac external power source. The ATA does not draw power from the Meridian Digital Telephone set.

The Analog Terminal Adapter (ATA) provides a RJ11 connection for analog equipment to operate on the same line as the Meridian Digital Telephone set. The Analog Terminal Adapter allows data to be transmitted and received using the public switched telephone network (PSTN). The ATA supports an analog device link to a desktop or laptop computer (with modems) in the digital telephone environment. Currently, it is necessary to install a separate analog phone line to be able to interface with the PSTN.

The ATA can be used for the following analog devices:

- FAX Machine
- Modem
- Analog Telephone

ATA operating parameters

The ATA data parameters are stored locally, although the configuration is set in the Meridian 1 system. Do not set data parameters in the system before installing the ATA in the telephone. If the parameters are set before the telephone is installed, the configuration information will be lost.

Simultaneous voice and data capabilities are available. When the ATA is installed, the System Administrator must activate the Flexible Voice and Data feature by configuring LD 11. See *Software Input/Output Guide Administration* (553-3001-311) for prompt and response details.

The ATA is capable of receiving dial pulse or DTMF address signaling from the analog equipment.

The ATA uses the 2nd channel of the TCM loop to add an analog port to the digital terminal. It has an RJ11 type jack accessible from the back of the telset.

The analog interface of the ATA is a 2-wire source, providing A and B leads (tip and ring) across which analog equipment (modem/fax) is connected. The loop length will be >100 feet. The analog interface of the ATA is compatible with the port types listed in Table 13.

Table 13
Port types compatible with ATA

County	Port Type(s)	Defining Standard(s)
United States	ONS Station Interface Class A OPS Station Interface	EIA/Tia-464A FCC Rules Part 68
Canada	ONS Station Interface Class 1300 OPS Station Interface	CAN3-T512.1 CS-03 Part I

Refer to *Analog Terminal Adapter Quick Reference Card* for detailed information on this feature.

List of terms

ACD	Automatic Call Distribution
ADO	Asynchronous Data Option
ATA	Analog Terminal Adapter
CCOS	Controlled Class of Service
CPND	Calling Party Name Display
DCE	Data Communications Equipment
DLC	Digital Line Card
DN	Directory Number
DSIC	Digital Set Interface Chip
DTE	Data Terminal Equipment

EIA	Electronic Industries Association
FCC	Federal Communications Commission
IDF	Intermediate Distribution Frame
ISDL C	Integrated Services Digital Line Card
LCD	Liquid Crystal Display
LED	Light Emitting Diode (lamp)
MDF	Main Distribution Frame
MPDA	Meridian Programmable Data Adapter
MCA	Meridian Communications Adapter
PCM	Pulse Code Modulation
TN	Terminal Number

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Meridian 1

Meridian 1 Telephones

Description and Specifications

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Meridian 1 European Digital Telephones

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October 1996

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Preface

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

This guide provides feature, add-on module, and specification information for Meridian digital telephones.

Other documentation

For more information, refer to the following documentation:

- *Digital Telephone Line Engineering* (553-2201-180)
- *Meridian Communications Unit and Meridian Communications Adapter: Description, Installation, Administration, Operation* (553-2731-109)
- *Spares Planning* (553-3001-153)
- *Equipment Identification* (553-3001-154)
- *Line Cards: Description* (553-3001-105)
- *Telephone and Attendant Console: Installation* (553-3001-215)
- *X11 Features and Services* (553-3001-306)
- *X11 Administration* (553-3001-311)
- *Asynchronous Data user guide*
- *Meridian Digital Telephones: M3902, M3903, M3904 Quick Reference Guide*
- *Meridian Digital Telephones: M3901, M3902, M3903, M3904 User Guide*

Meridian digital telephones

This chapter provides feature, add-on module, relocation, and specification information for Meridian digital telephones.

Functional description

Meridian digital telephones are designed to provide cost-effective integrated voice and data communication. These telephones communicate with the Meridian 1 using digital transmission over standard twisted-pair wiring. They interface with the Meridian 1 using the Integrated Services Digital Line Card (ISDL) or the eXtended Digital Line Card (XDLC).

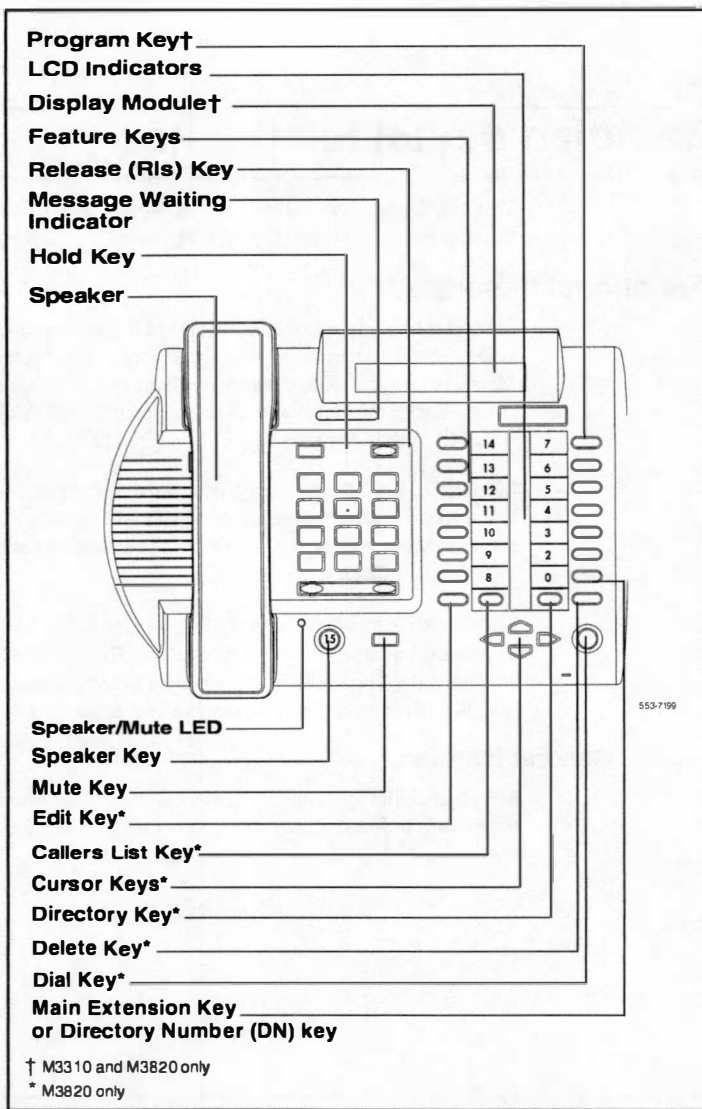
Meridian digital telephones are connected to the system through a two-wire loop carrying two independent 64 kbs PCM channels with associated signaling channels. One of the two PCM channels is dedicated to voice while the other is dedicated to data traffic.

The telephone interfaces with the Digital Line Card (XDLC) or ISDL in the Peripheral Equipment shelf of the system. The XDLC supports 16 voice and 16 data ports. The ISDL supports eight voice and eight data ports. A TN is assigned to each port in the system software.

General features

Meridian digital telephones support many general features. The location of the buttons used to activate and interact with these features is shown in Figure 1.

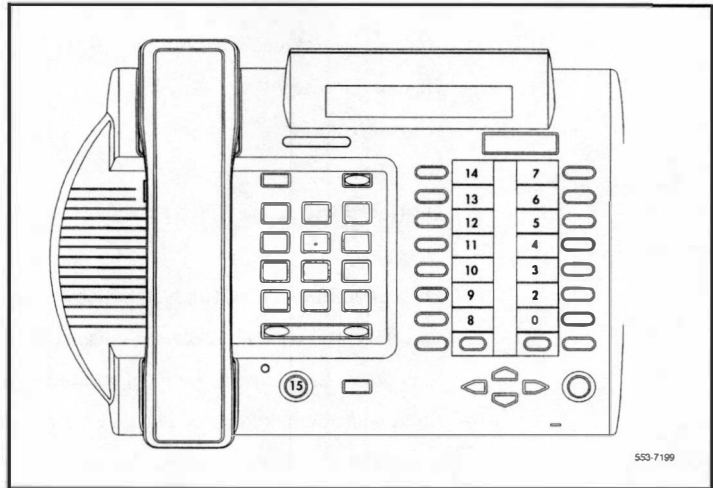
Figure 1
The Location and Function of Buttons on the Meridian digital telephone



The three telephones that support the various feature levels are as follows:

M3820

Figure 2
M3820 Meridian digital telephone



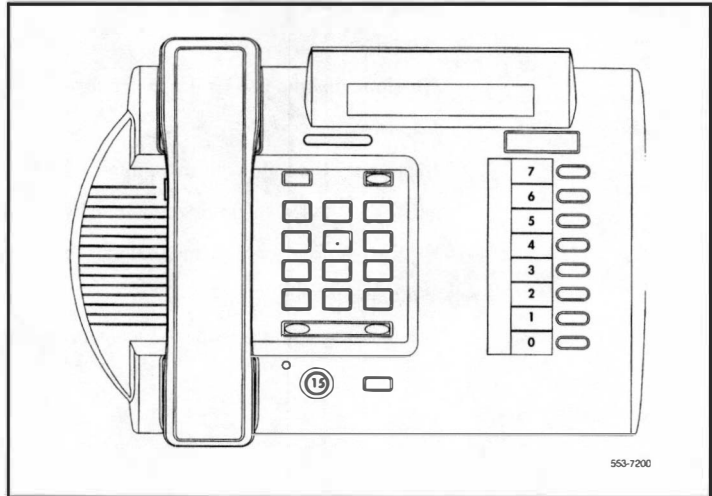
The M3820 Meridian digital telephone supports the following features:

- Handsfree, On-Hook Dialling and Group Listening
- Dedicated Release and Hold keys
- Message Waiting and Speaker/Mute Indicators
- Headset Socket
- 2 x 24 character display
- 20 Feature keys including:
 - Store/program key
 - 13 system programmable keys
 - Handsfree/speaker key
 - Mute key

- Directory key
- Caller's List key
- Edit key
- Delete key
- Volume control for:
 - Handset/Headset
 - Ringing Tone
 - Buzz Tone
 - On-Hook dialling and Group Listening
 - Handsfree
- Directory/Caller's List with 9 dedicated keys namely:
 - Directory, Callers, Edit, Delete, 4 cursor and Dial
- Support for the following terminal options:
 - MCA data option to provide integrated voice and data
 - External Alarmer for high ambient noise environments
 - Wall mount ability
 - Add-on Key Expansion Modules (2 maximum)
- Brand line insert to provide for special company logos

M3310

Figure 3
M3310 Meridian digital telephone



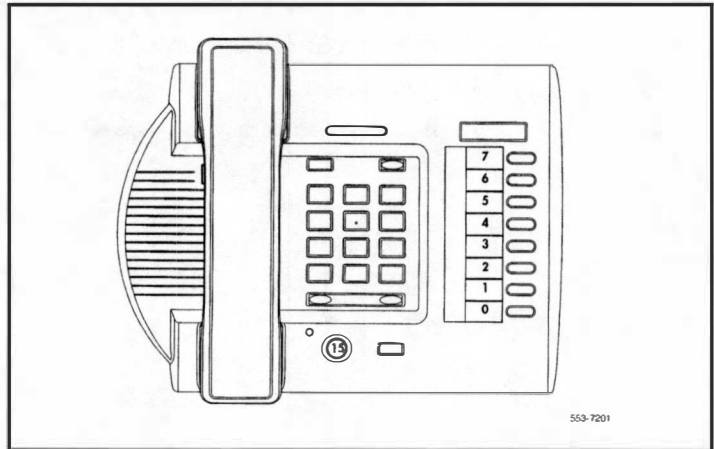
The M3310 Meridian digital telephone supports the following features:

- Handsfree, On-Hook Dialling and Group Listening
- Dedicated Release and Hold keys
- Message Waiting and Speaker/Mute Indicators
- Headset Socket
- 2 x 24 character display
- 10 Feature keys including:
 - Program key
 - 7 system programmable keys
 - Speaker key
 - Mute key

- Volume control for:
- Handset/Headset
- Ringing Tone
- Buzz Tone
- On-Hook dialling and Group Listening
- Handsfree
- Support for the following set options:
 - MCA data option to provide integrated voice and data
 - External Alerter for high ambient noise environments
 - Wall mount ability
- Brand line insert to provide for special company logos

M3110

Figure 4
M3110 Meridian digital telephone



The M3110 Meridian digital telephone supports the following features:

- On-Hook Dialling and Group Listening
- Dedicated release and hold keys
- Message Waiting and Mute Indicators
- 10 Feature System Programmable keys including:
 - 8 system programmable keys
 - Mute key
 - Speaker key
- Volume control for:
 - Handset
 - Ringing Tone
 - Buzz Tone

- On-Hook dialling and Group Listening
- Support for the following terminal options:
 - MCA data option to provide integrated voice and data
 - External Alerter for high ambient noise environments
- Wall mount ability
- Brand line insert to provide for special company logos

Meridian digital telephones used with a headset

You can use an electret headset in the headset port of the digital telephones (M3310 and M3820 only). Alternatively, choose an amplified headset that draws power from a battery or AC transformer; power is not provided by the telephone. The amplifier must draw less than 400 micro amps from the telephone jack.

The headset should be designed to work with a telephone jack with these characteristics:

Transmit interface: +5 V through 10K DC bias resistance with maximum current of 500 micro amps. The differential input impedance is 10K ohms. Connects to pins 2 and 5 of the headset jack.

Receive interface: single ended output with output impedance of 180 ohms. Connects to pins 3 and 4 of the headset jack.

Physical characteristics

Fixed keys (same for all three models)

- **Hold:** By pressing the hold key, you can put an active call on hold. Return to the caller by pressing the extension key beside the flashing LCD indicator.
- **Release (Rls):** You can terminate an active call by pressing the Rls key or by hanging up the handset. The release key is especially useful for disconnecting handsfree and headset calls.
- **Volume control:** The volume key controls the volume of the handset, the speaker and the ringer. Raise the volume by pressing the right side of the bar. Lower it by pressing the left side.
- **Mute:** When engaged in a call, you can press the mute key. The party(ies) to whom you are speaking cannot hear you. This is especially useful when on a conference call and you are only listening. When you wish to return to the two-way conversation, you must push the mute key again. The mute key applies to handsfree, handset and headset microphones.
- **Speaker/Handsfree:** The speaker key allows you to activate handsfree and group listening features. Handsfree is only available on the M3310 and M3820 models and is enabled by the system administrator. If handsfree is not configured at the switch, the telephone can only be used to listen.

The table below indicates the mode the terminal is in when the speaker key is operated under the various switch and set operations.

Table 1
Speaker Key Function

MODEL	Handsfree not selected at the switch	Handsfree selected at the switch - Group listening off	Handsfree selected at the switch - Group listening On
M3820	CPM and primary DN key-Speaker LED is not illuminated	HF and Primary DN key - speaker LED is on when in Handsfree mode	HF, Group listening and Primary DN key - speaker LED is on when in HF or Group Listening mode
M3310	CPM and Primary DN key-Speaker LED is not illuminated	HF and Primary DN key - Speaker LED is on when in HF mode	HF, Group Listening and Primary DN key - Speaker LED is on when in HF or group listening
M3110	CPM and Primary DN key- Speaker LED is not illuminated	N/A	Group listening and Primary DN key - speaker LED is on when in Group listening mode.

Note 1: CPM is Call Process Monitor which enables the user to hear, for example, the dial tone in the speaker. Group listening enables the user to speak through the handset/headset microphone and one or more parties can listen through the speaker, thus hearing both sides of the conversation. In Handsfree mode, the user (or group of users) uses both the handsfree microphone and speaker.

Note 2: Group listening is switched on or off under the program key option *1. (M3820 and M3310 only)

Additional feature keys

Message Waiting lamp key. Each telephone has a red message waiting LED just above the hold and Rls keys that lights to indicate a message is waiting. This LED is the primary message waiting indicator and lets you know that a message is waiting, regardless of whether the telephone has a message waiting key/lamp pair. You must have Message Waiting allowed Class of Service. See LD 11, *X11 Administration* (553-3001-311) and *X11 Maintenance* (553-3001-511).

If you do assign a message waiting key/lamp pair, there will be two indications of a message waiting:

- the red Message Waiting LED lights
- the LCD associated with the Message Waiting key blinks

Autodial key. You can assign an Autodial Key that dials the message center (or voice mail system) to avoid the double indication or have no key/lamp pair assigned to the message center.

Programmable Feature keys

Each Meridian digital telephone has a number of programmable keys with LCD indicators that can be assigned to any combination of directory numbers and features. The M3820 has 13 fully programmable feature keys; the M3310 has seven, and the M3110 has eight. The lower right-hand key (key 0) is reserved for the Primary DN.

LCD indicators support four key/LCD states:

Function	LCD state
idle	off
active	on (steady)
ringing	flash (60 Hz)
hold	fast flash (120 Hz)

Note: An indicator fast flashes when you have pressed a feature key but have not completed the procedure necessary to activate the feature.

Software requirements

Meridian digital telephones are supported by X11 release 16 and later software. The package number for the Meridian digital telephones is (170.) The mnemonic is ARIE. The DSET package (88) and the TSET package (89) are required.

Terminal Options

This section describes the options available for Meridian digital telephones. Table 2 lists the features and optional hardware available for each telephone.

Table 2
Hardware features and options

	M3820	M3310	M3110
Programmable Feature keys	13	7	8
Handsfree microphone	x	x	
Optional hardware available:			
Key Expansion Module	x		
Meridian Communications Adapter (MCA)	x	x	x
External alerter interface	x	x	x
Brandline insert	x	x	x
Note: In this table, x indicates available features for the telephone type listed in the top row.			

External Alerter interface

The External Alerter Board provides an interface to standard remote ringing devices, such as a ringing unit, installed in a location separate from the telephone. The External Alerter interface is not the remote ringer itself, but provides access to standard, off-the-shelf remote ringing devices. The Alerter Board requires additional power. See "Power requirements" on page 37.

You can program the External Alerter interface to activate a ringer (or light) when the telephone rings or when the telephone is in use (off-hook).

For information on installing and setting up the External Alerter, see "Add-on modules" in *Telephone and Attendant Console: Installation* (553-3001-215).

Brandline insert

The telephone contains a removable insert designed to accommodate custom labeling. You can order blank Brandline Inserts and have a printer silk screen your company logo on them.

Key Expansion Module

A 22-key unit module can be attached to any M3820 terminal. The extra keys can be assigned to any combination of lines and features. You can add up to two expansion modules to a terminal. You will need a separate footstand for the module(s), one for a single module, one for a double.

Meridian Communications Adapter (MCA)

The MCA lets you connect your telephone to a personal computer or terminal. You can then use your telephone to exchange data between your computer and other computers. The MCA can be used with all three models.

Installation

Configuration and Installation

Configuration

Use Overlay 11 (Meridian Digital Telephone Administration) to configure the telephones. All prompts are defaulted (or set as required) except for those noted in the tables following:

Table 3
M3110 Configuration

Prompt	Response	Comments
REQ	NEW	
TYPE	2616	M2616 set model used
DES	M3110	Enter appropriate set identifier
CLS	HFA (HFD)	Group Listening Allowed (Denied)
	NDD	No digit display
KEY 08	NUL	Keys 8-14
	09 NUL	programmed as NUL.
	10 NUL	If Group Listening is
	11 NUL	denied (CLS HFD),
	12 NUL	Key 15 is also
	13 NUL	programmed as NUL.
	14 NUL	
If Group Listening is denied (CLS HFD), Key 15 is also programmed as NUL.		

Figure 5
M3110 Key Designation

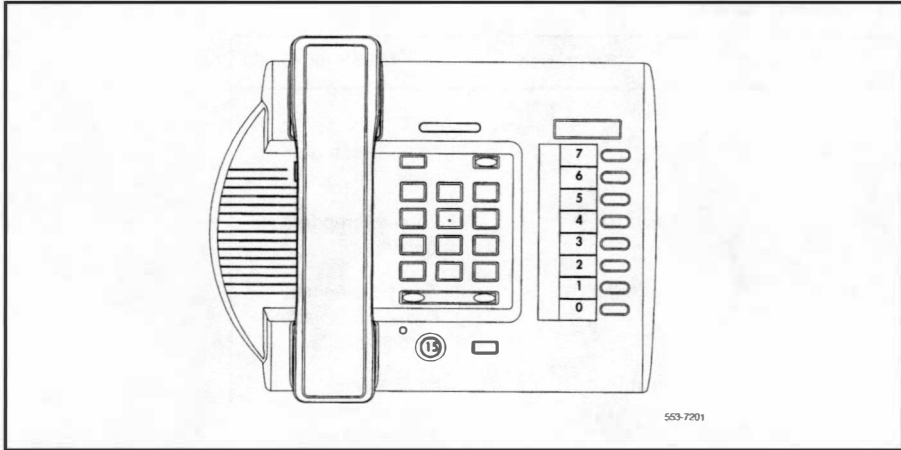


Table 4
M3310 Configuration

Prompt	Response	Comments
REQ	NEW	
TYPE	2616	M2616 set model used
DES	M3310	Enter appropriate set identifier
CLS	HFA (HFD)	Handsfree Allowed (Denied)
KEY	08 NUL 09 NUL 10 NUL 11 NUL 12 NUL 13 NUL 14 NUL	Keys 8-14 programmed as NUL. If Handsfree is denied (CLS HFD), Key 15 is also programmed as NUL.

Figure 6
M3310 Key Designations

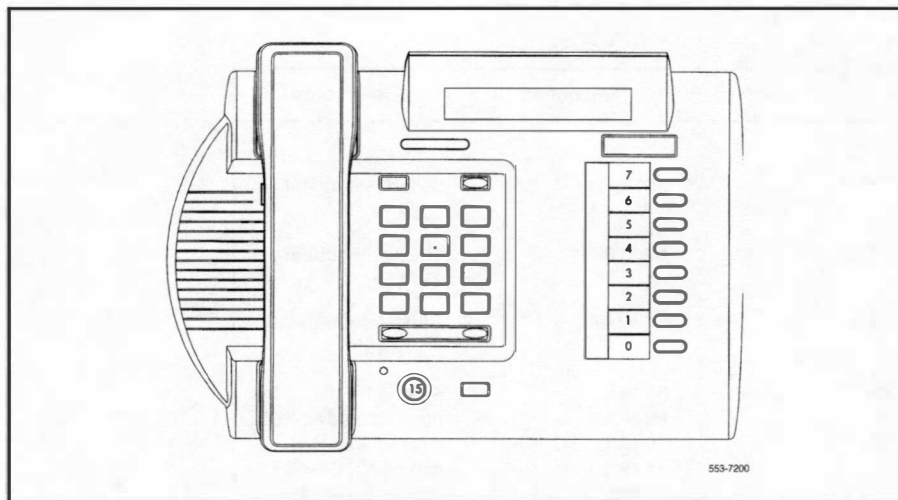


Table 5
M3820 Configuration

Prompt	Response	Comments
REQ	NEW	
TYPE	2616	M2616 set model used.
DES	M3820	Enter appropriate set identifier.
CLS	HFA (HFD)	Handsfree Allowed (Denied)
	AHA	Automatic Hold Allowed
	DNDD	Dialed Name Display Denied
	CNDA	Call Party Name Display Allowed
	CNIA	Call Number Information Allowed
	LNA	Last Number Redial Allowed
KEY	01 NUL Note: If short hunt is configured, then Key 01 must be configured as an SCR key with the same DN as key 0. For MARP to operate with short hunt configured, Key 01 must be configured as the MARP key.	Keys 01 programmed as NUL. If Handsfree is denied (CLS HFD), Key 15 is also programmed as NUL.

Figure 7
M3820 Key Designations

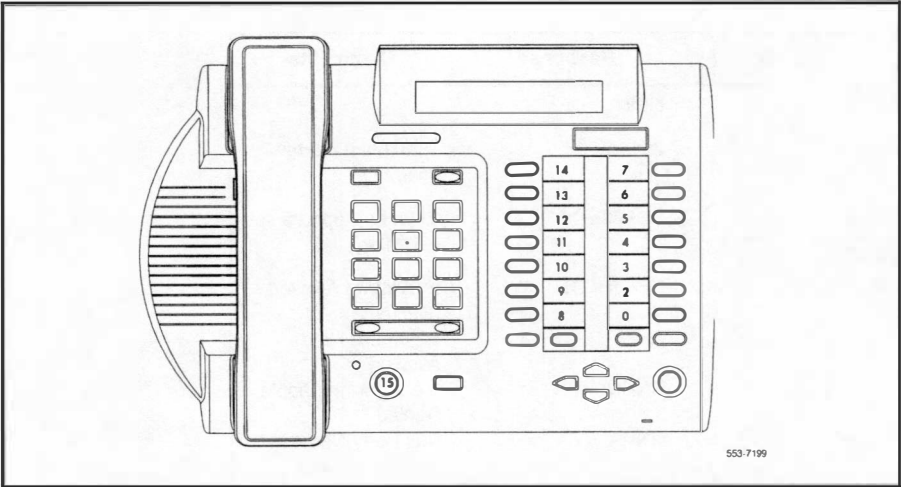


Table 6
Overlay 20 Print Routine

Prompt	Response	Comments
REQ	PRT	
TYPE	2616	M2616 set model used.
DES	M3110 M3310 M3820 M3+	Enter appropriate set identifier Or M3+ to get a list of all three set types.

Installation

The Installation procedure for Meridian digital telephones follows:

- 1 Complete the wiring and cross-connections (loop power) before connecting the telephone to the connecting block.
- 2 Place the telephone on the desk in the normal operating position.
- 3 Place the RIs and Hold key caps on their positions just above the dialpad, with the Hold key closest to the handset.
- 4 Print the directory number on the designation card. Remove the number lens from its position underneath the handset, insert the designation card and snap the lens into place.
- 5 Print the feature keys on the label strip. Remove the label lens (beside the feature keys), insert the label strip and snap the lens into place.
- 6 Plug the line cord connector into the connecting block.
- 7 Perform the self test and acceptance procedures (see procedure 16 for Meridian Modular telephones in the *Telephone and Attendant Console: Installation* (553-3001-215)).
- 8 Supply the user with a quick reference card.

Installation of Hardware Options

This section describes the procedure for installation of the following options:

- 1 Power Board on all models.
- 2 Headset on M3310 and M3820 telephones.
- 3 Wallmount/Desktop Position change.

For installation of other options (MCA data option, external alerter and key expansion modules) see the section on Add-on modules for Meridian Modular Telephones (NT2K models) in the *Telephone and Attendant Console: Installation* (553-3001-215).

Power Board Installation

To open the Telephone:

- 1 Place the telephone, upside-down, on a padded, level surface.
- 2 Using a #1 Phillips screwdriver, remove the two screws holding the footstand (if fitted).
- 3 Disconnect and remove all cords including the handset and headset if fitted, from the telephone.
- 4 Use a #1 Phillips screwdriver and remove the four screws holding the base of the telephone.

To install the Power Board:

- 1 Remove the cable from the power board including the right angle header.
- 2 Disconnect the display cable from P4 on the main PCB. Note the orientation of this connector.
- 3 Place the power board to the left of the main PCB with the widest section of the power board nearest the display. Make sure that the display cable comes over the power board.
- 4 Clip the power board in place, by inserting the right hand side of the board under the clip, then push down on the left hand side adjacent to the clips provided.
- 5 Use a #1 Phillips screwdriver and the screw supplied to fasten the power board to the front cover of the telephone.
- 6 Remove and discard the two links on J8 on the telephone's main PCB.
- 7 Connect the power board cable (B0247405) to J8.

Note the key to prevent misconnection.

- 8 Connect the cable to the header at H1 on the power board as shown in the figure below).
- 9 Reconnect the display cable to P4.

Note: Do NOT twist the cable.

To reassemble the Telephone:

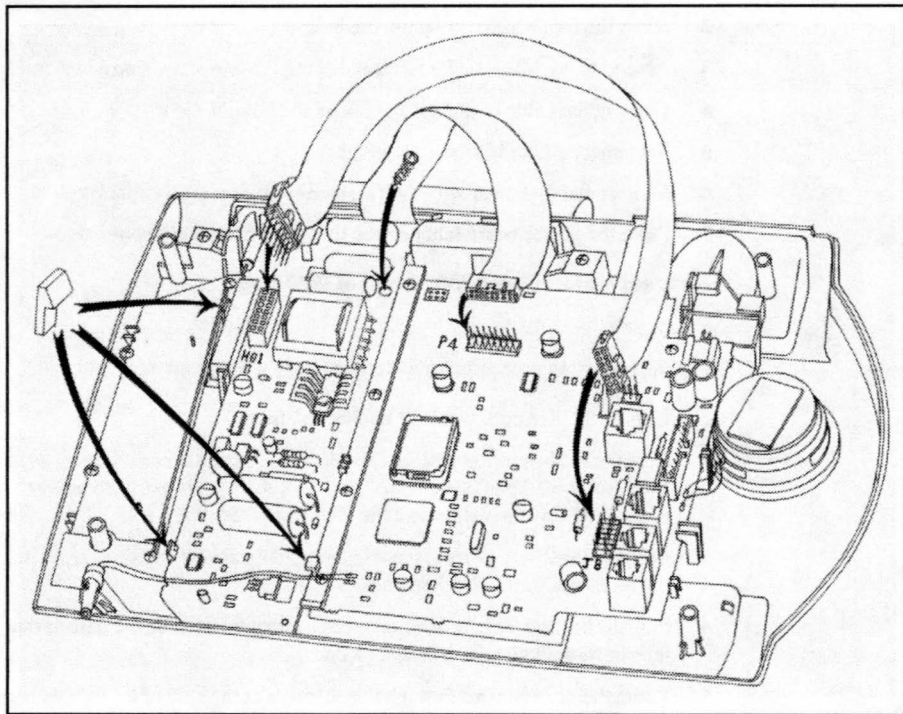
- 1 Replace the base cover and make sure that the cables lie flat.
- 2 Insert the four screws to secure the base.
- 3 Assemble the MCA to the footstand using the two screws provided.
- 4 Connect the cable to the 8 way jack on the base of the telephone.
- 5 Reconnect all cords to the telephone.
- 6 Replace the footstand with the two screws (if previously fitted).
- 7 Place the power board label on the footstand for tracking purposes.

Headset Installation (M3310 and M3820 only)

Use the following procedure to add a headset to a Meridian telephone:

- 1 Unplug the line cord from the connecting block.
- 2 Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to moveable keys and the telephone face.
- 3 Remove the 2 screws from the telephone footstand (if fitted) to separate the footstand from the telephone.
- 4 Plug the headset TELADAPT connector into the socket on the base of the telephone marked with a headset icon.
- 5 Route the headset cord through the channels at the side of the telephone.
- 6 Replace the footstand in the same position and tighten both screws (if previously fitted).
- 7 Place the telephone back on the desk in the normal operating position.
- 8 Plug the line cord connector back into the connecting block.

Figure 8
Power Board Installation



Telephone Positions

Your Meridian telephone can be installed in three different positions - two desktop positions and a wall mount position. The two desktop positions provide two different angles for the telephone on the desktop. The telephone is supplied in the steeper of the two positions. The procedure to change to the more shallow angle is as follows:

- 1** Unplug the line cord from the connecting block.
- 2** Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to moveable keys and the telephone face.
- 3** Remove the 2 screws from the telephone footstand (if fitted) to separate the footstand from the telephone.
- 4** Snap the footstand back into place using the alternate slots located closer to the back of the set and tighten the screws (if previously fitted).
- 5** Place the telephone back on the desk in the normal operating position.
- 6** Plug the line cord connector back into the connecting block.

The procedure to wall mount the telephone by reversing the footstand is as follows:

Note 1: The footstand cannot be reversed when the MCA data option or key expansion module is equipped so such telephones cannot be wall mounted.

Note 2: An additional clip is provided for wall mounting the telephone. This clip is attached to the switchhook rest to prevent the handset from slipping when mounted on the wall.

- 1** Unplug the line cord from the connecting block.
- 2** Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to moveable keys and the telephone face.
- 3** Remove the 2 screws from the telephone footstand (if fitted) to separate the footstand from the telephone.

- 4 Remove the wall mount clip located inside the footstand and insert the clip in the switchhook rest using the holes provided.
- 5 Rotate the footstand 180 degrees, snap the footstand back into place and tighten the screws. Note that the footstand must be screwed to the base for wall mounting.
- 6 Mount the telephone on the wall using the wall mount holes provided on the bottom of the footstand.
- 7 Plug the line cord connector back into the connecting block.

Specifications

This section lists the specifications required for Meridian digital telephones.

Environmental and safety considerations

All Meridian digital telephones are designed to comply with:

EN 60950:1992 - Safety of Information Technology Equipment including Electrical Business Equipment.

EN 41003:1993 - Particular Safety Requirements for Equipment to be connected to Telecommunication Network.

Temperature and humidity

Operating state:

Temperature range 0° to 50°C (32° to 104°F)

Relative humidity 5% to 95% (noncondensing). At temperatures above 34°C (93°F) relative humidity is limited to 53 mbar of water vapor pressure.

Storage:

Temperature range -50° to 70°C (-58° to 158°F)

Relative humidity 5% to 95% (noncondensing). At temperatures above 34°C (93°F) relative humidity is limited to 53 mbar of water vapor pressure.

Electromagnetic interference

All the digital telephones are designed to comply with:

EN 50082-1:1992 - Electromagnetic Compatibility - Generic immunity standard Part 1: Residential, commercial and light industry.

EN 50081-1:1992 - Electromagnetic Compatibility - Generic emissions standard. Generic standard class: Residential, commercial and light industry.

Line engineering

Meridian digital telephones use twisted pair wiring on transmission lines selected by the rules given in *Digital Telephone Line Engineering* (553-2201-180). The maximum permissible loop length is 3500 ft. (1067 m), assuming 24 AWG (0.5 mm) standard twisted wire with no bridge taps. A 15.5 dB loss at 256 kHz defines the loop length limit. (Longer lengths are possible, depending on the wire's gauge and insulation.) Table 7 gives detailed information on loop lengths.

Table 7
Loop lengths for Meridian digital telephones

	QPC578 A and B	QPC578 C +	NT8D02
PVC insulated cable (polyvinyl chloride)			
22 or 24 AWG	100–3000 ft. (30.5–915 m)	0–3500 ft. (0–1067 m)	0–3500 ft. (0–1067 m)
26 AWG	100–2100 ft. (30.5–640 m)	0–2600 ft. (0–945 m)	0–2600 ft. (0–793 m)
Note 1: No bridge taps or loading coils are allowed.			
Note 2: Effect of line protector at MDF reduces loop length by 500 ft.			

Note: Use only the line cord provided with the telephone. Using a cord designed for another telephone could result in damage to the cord.

Local alerting tones

Each telephone provides four alerting tones and a buzz sound. The system controls the ringing cadence by sending tone-ON and tone-OFF messages to the telephone. The alerting tone cadences cannot be changed from the telephone but can be altered for individual terminals by software controlled adjustments in the system. See *X11 Administration* (553-3001-311). All other telephone tones, such as dial tone or overflow, are provided by the Meridian 1 from a Tone and Digit Switch.

Alerting tone characteristics

The tone frequency combinations are as follows:

Tone	Frequencies	Warble Rate (Hz)
1	667 Hz, 500 Hz	5.2
2	667 Hz, 500 Hz	2.6
:		
3	1600 Hz, 2000 Hz	5.2
4	1600 Hz, 2000 Hz	2.6
:		
3	333 Hz, 250 Hz	5.2
4	333 Hz, 250 Hz	2.6

A 500 Hz buzz signal is provided for incoming call notification while the receiver is off-hook.

Power requirements

The Meridian digital telephones are loop powered. Loop power, originating in the ISDL or the DLC, consists of a 30 V dc power source and assumes a 3500 ft. (1219 m) maximum loop length of 24 AWG (0.5 mm) wire and a minimum 15.5 V dc at the telephone terminals.

Note: The loop length limit is defined by a 15.5 dB loss at 256 KHz. Longer lengths can be determined using the wire's gauge and insulation.

Some configurations of telephones and options need more than basic loop power to operate. Table 8 lists the types of Meridian digital telephones and shows when additional power is needed to operate the telephone or its optional hardware. Power Supply Boards come installed in factory-assembled configurations that require additional power.

Note: If a power failure occurs, configurations that require loop power will continue to work only if the system has battery backup. Only those options that require additional power will cease to function.

Table 8
Power requirements, Meridian digital telephones

Telephone type	Loop power	Additional power (Power Supply Board)
M3820	Terminal, handsfree, headset, key expansion	MCA, External Alerter Interface
M3310	Terminal, headset, handsfree	MCA, External Alerter Interface
M3110	Terminal	MCA, External Alerter Interface

Power supply board

The power supply option consists of a power supply board that mounts inside the telephone, coupled with an external wall-mount transformer or closet power supply that provides power to the power supply board. The power supply board receives its power through pins 1 and 6 of the line cord.

The power supply board connects to the telephone through a 14-pin bottom entry connector.

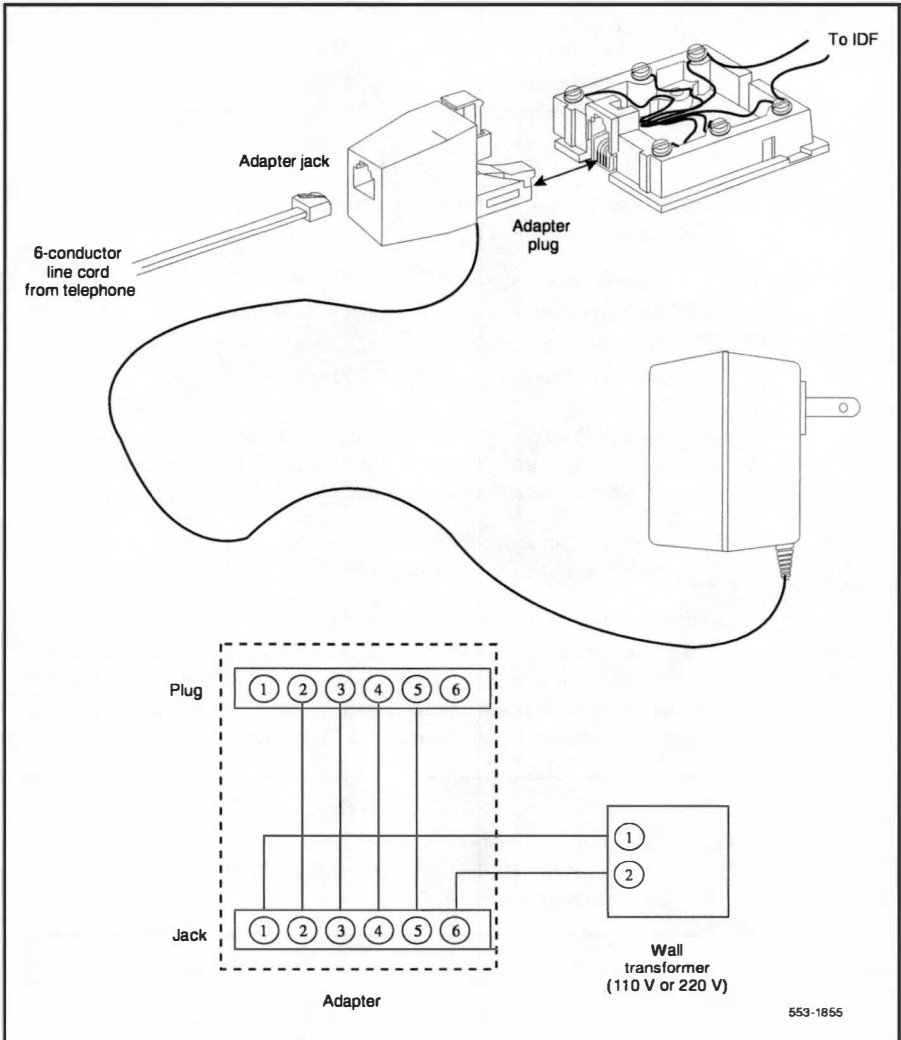
Local plug-in transformer

A single winding transformer equipped with a 10 ft. (3 m) cord of 22 AWG two-conductor stranded and twisted wire with a modular RJ-11 duplex adapter can provide the additional power needed to operate the telephone and its options. (See Figure 9).

CAUTION

Do not plug any equipment other than the terminal into the RJ-11 transformer adapter, as damage to equipment can result.

Figure 9
Configuration of local plug-in transformer



120 V transformer The following minimum specifications must be met by this transformer:

Input voltage	120 V ac/60 Hz
No load output voltage	29 V ac maximum
Voltage at rated current	26.7 V ac minimum
Rated load current	700 mA

240 V transformer The following minimum specifications have to be met by this transformer:

Input voltage	240 V ac/50 Hz
No load output voltage	29 V ac maximum
Voltage at rated current	26.7 V ac minimum
Rated load current	700 mA

Note 1: You cannot wall mount the telephone over the wall jack when using a transformer because of the size of the RJ-11 adapter. Hang it above or to the side of the jack and run the line and power cords to it.

Note 2: The above-mentioned transformers can also be used with outlets identified as 110V or 220V.

Closet Power Supply

Closet power can be obtained from an AC transformer for loops of 100 ft. (30 m) or less, or a DC transformer for loop lengths of 650 ft. (198 m) or less. An equivalent power source can be used but must be UL listed to provide isolation of outputs to the terminal. See Figure 10.

CAUTION

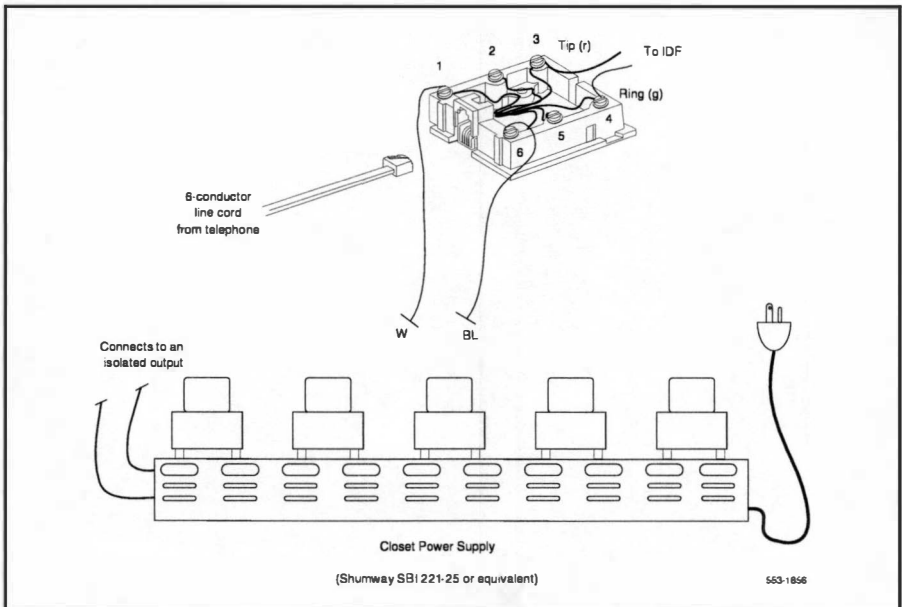
When using closet power, do not plug the TELADAPT connector into any equipment other than the Meridian digital telephone, as damage to equipment may result.

Note 1: All terminals must be isolated from the input winding and each terminal must be isolated from all other terminal windings. A separate winding is required for each terminal, and grounds must not be connected.

Note 2: The QUT1 closet power supply source is not compatible with Meridian digital telephones.

The AC source must be rated at 29 V ac, 700 mA isolated. The DC source must be rated at 42 V dc, 300 mA isolated, with current limiting output of 1 amp.

Figure 10
Closet Power Supply configuration



Glossary

This section lists, by alphanumeric order, the acronyms, abbreviations, and initializations used in this guide.

ACD

Automatic Call Distribution

ADO

Asynchronous Data Option

COS

Class of Service

CCOS

Controlled Class of Service

CPM

Call Progress Monitor

CPND

Calling Party Name Display

DCE

Data Communications Equipment

DLC

Digital Line Card

DN

Directory Number

DSIC

Digital Set Interface Chip

DTE

Data Terminal Equipment

EIA

Electronic Industries Association

FCC

Federal Communications Commission

IDF

Intermediate Distribution Frame

ISDL

Integrated Services Digital Line Card

LCD

Liquid Crystal Display

LED

Light Emitting Diode (lamp)

MDF

Main Distribution Frame

MCA

Meridian Communications Adapter

PCM

Pulse Code Modulation

TN

Terminal Number

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Meridian 1

Meridian 1 European Digital Telephones

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Meridian 1

M3900 Series Meridian Digital Telephones

Description, Installation and Administration

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Revision history

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Standard 5.00. Up-issued to include content for Meridian 1 Release 25.40 and M3900 Phase III.

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Standard 4.00. This is a global document and is up-issued for X11 Release 25.0x. Document changes include removal of: redundant content; references to equipment types except Options 11C, 51C, 61C, and 81C; and references to previous software releases.

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August 1999

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June 1999

Standard 1.00.

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About this document

This document applies to Meridian 1 Internet Enabled systems.

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

This document introduces the M3900 Series Meridian Digital Telephones and provides the user with description, installation, and administration information for the M3900 Series telephones.

Related documents

Refer to the following documents for additional information:

- *Digital Telephone Line Engineering* (553-2201-180)
- *Spares Planning* (553-3001-153)
- *Equipment Identification* (553-3001-154)
- *Line Cards: Description* (553-3001-105)
- *Features and Services* (553-3001-306)
- *Administration* (553-3001-311)
- *System Messages Guide* (553-3001-411)
- *Maintenance* (553-3001-511)

Functional description

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Reference list

The following are the references in this section:

- *Software Conversion Procedures (553-2001-320)*

Overview

M3900 telephones communicate with the Meridian 1 through digital transmission over standard twisted pair wiring. M3900 telephones can interface with all versions of the Intelligent Peripheral Equipment (IPE) Digital Line Card (DLC). The DLC supports 16 voice ports and 16 data ports. The system software assigns a Terminal Number (TN) to each port in the system.

Note: M3900 Series telephones are not supported by the Enhanced Peripheral Equipment (EPE) based Digital Line Card.

Enhancements for X11 Release 25 and X11 Release 25.40

The following enhancements to the M3900 Series telephones are introduced with X11 Release 25:

- Context Sensitive Soft Keys (M3903 and M3904)
- Set-to-Set Messaging (M3903 and M3904)
- Corporate Directory (M3903 and M3904)
- Virtual Office (M3903 and M3904)
- Support for the Display-based Expansion Module accessory (M3904)
- Flash Download of firmware to M3902, M3903, M3904 and M3905 telephones
- Language selection, during software installation, for M3900 Series telephone displays

The following enhancements to the M3900 Series telephones are introduced with X11 Release 25.40 (M3900 Phase III):

- Full Duplex Handsfree (M3904 Phase III)
- System-Initiated Language Selection (M3902, M3903, M3904, and M3905)
- Call Forward Enhancements (M3903, M3904, and M3905)
- 31-digit dialing (M3902, M3903, M3904, and M3905)
- Callers List soft key (M3903, M3904, and M3905)
- Redial List soft key (M3903, M3904, and M3905)
- Pause in Dialing String (M3902, M3903, M3904, and M3905)
- Special Character Support (M3902, M3903, M3904, and M3905)
- Headset State Support (M3903, M3904, and M3905)
- Set to Set Messaging Enhancements (M3903, M3904, and M3905)
- One-button Feature Access to Corporate Directory (M3903, M3904, and M3905)
- Corporate Directory Search Enhancement (M3903, M3904, and M3905)

- Virtual Office Enhancements (M3903 and M3904)
- Virtual Office Clearing of the Callers List and Redial List (M3903 and M3904)
- Context Sensitive Soft Keys (M3905)
- Automatic Logout for Virtual Office
- Speed Call for Virtual Office
- System-Initiated Language Download
- Set-to-Set Messaging Enhancements
- Personal Directory fixed feature key

Full Duplex Handsfree

The Full Duplex Handsfree (FDHF) functionality allows simultaneous two-way communication during a handsfree call. For Full Duplex Handsfree functionality, you require an M3904 Phase III set equipped with an FDHF cartridge.

Refer to “Full Duplex Handsfree” on page 52 for information on the FDHF hardware requirements.

The receive audio level is attenuated during the FDHF mode while both parties are speaking. Therefore, fluctuations in the receive volume can occur during the FDHF call.

During a call, the FDHF cartridge can be inserted or removed from the ACM without interrupting an established call. If the FDHF cartridge is removed, half-duplex operation is restored.

Table 1 shows FDHF interoperability with other M3900 cartridges.

Table 1
FDHF Interoperability

	External Alerter and Recording Interface	CTIA	ATA	PC Utility
FDHF	YES See Note below	YES	NO	YES
Note: FDHF works with the External Alerter and Recording Interface functionality; however, FDHF does not work with the External Alerter and Recording Interface when a recording device is connected.				

To initiate Full Duplex Handsfree functionality, follow the existing steps for Handsfree operation in the *M3901, M3902, M3903, and M3904 User Guide*.

System-Initiated Language Selection

With the System-Initiated Language Selection feature, the system administrator can define a default language on a customer basis for M3902, M3903, M3904, and M3905 sets. The default language defined by the system administrator applies to all new M3900 sets configured for the customer group.

When the system administrator configures a new M3900 set, the default language is sent to the set as part of the key map download. If necessary, the system administrator can override the system default.

Note: If the system administrator overrides the system default, it only affects the language on the set; it does not affect the system default.

If the user changes the default language for their set, the new language selection is uploaded to the Meridian 1 system. The new language selection overrides the language configured for the Terminal Number (TN).

This functionality allows Virtual Office workers to store their language selection on the Meridian 1 system. When the virtual worker logs in to a host set, the language selection changes to the language defined for the virtual worker.

Call Forward Enhancement for M3900 sets

The Call Forward Enhancement feature modifies the method for activating Call Forward on M3903, M3904, and M3905 sets.

To forward your calls or change the previously stored Call Forward number, perform the following steps:

- 1 Press the Forward key.
The previously stored Call Forward number appears, if one exists.
- 2 If you want to keep the previously stored Call Forward number, press Done.

If you want to enter a new Call Forward number, go to Step 3.
- 3 Enter the new Call Forward number.
When you start to enter the new number, the initial Call Forward number automatically deletes.

Note 1: You can use the Delete key to delete each digit in the Call Forward number shown. To edit the number, use the Left or Right Navigation keys to move the cursor.

Note 2: A Cancel key also appears. Press the Cancel key to exit without changing the previously stored Call Forward number.

- 4 Press Done.

31-Digit Dialing

With the 31-Digit Dialing feature, M3900 display screens accommodate dialing strings of up to 31 digits. This allows the screens to fully display long dialing strings, such as Calling Card numbers and access codes.

The M3902 set has a one-line display. Use the Left/Right Navigation keys to scroll through the digits on the line.

M3903, M3904, and M3905 display screens accommodate 24 characters on each line. For dialing strings greater than 24 characters, the number automatically wraps to the second line.

Table 2 lists the features that support 31-Digit Dialing on M3902, M3903, M3904, and M3905 sets.

Table 2
Features that support 31-Digit Dialing

	M3902	M3903	M3904	M3905
Personal Directory			X	X
Call Log		X	X	X
Redial		X	X	X
Predial	X	X	X	X

Context Sensitive Soft Keys

The four keys immediately below the display on the M3903, M3904, and M3905 telephones are referred to as Soft Keys. The function or features accessed by these keys varies depending on:

- the features configured for the telephone
- whether the phone is on-hook, off-hook, or on a call
- whether the Options List, Directory/Log, or Applications are in use

With Context Sensitive Soft Keys, only the features that are applicable and configured for your telephone appear on the soft labels above these keys.

For example, while you are on a call, you may have access, via the Soft Keys, to features such as Transfer and Conference. You will not, however, have access to Forward since you do not forward your telephone while on a call.

The following features can be accessed through the Context Sensitive Soft Keys:

- Call Log (Callers List)
- Call Log (Redial List)
- Call Transfer (TRN)
- 6 Party Conference (AO6)/3 Party Conference (AO3)

- Call Forward (CFW)
- Ring Again (RGA)
- Call Park (PRK)
- Ringing Number Pickup (RNP)
- Speed Call (SCU/SCC/SSU/SSC)
- Privacy Release (PRS)
- Charge Account (CHG)
- Calling Party Number (CPN)

Callers List

M3900 Phase III introduces a Callers List soft key for M3903, M3904, and M3905 sets. Press either the soft key or the programmable feature key to go directly to the new callers in the list.

Note: If there are no new callers in your Callers List, when you press the Callers List soft key or programmable feature key, you go directly to the old Callers List.

The default soft key assignment for the Callers List is 27. However, if the system administrator configures a Callers List programmable feature key, the Callers List soft key is automatically removed. If necessary, the system administrator can add the soft key back on the predefined soft key number.

Password protection applies to One-Button Feature Access to the Callers List. If the password is enabled, when you press the Callers List soft key, a prompt appears requesting password entry. Once you enter the correct password, you can access the “new” Callers List.

Redial List

M3900 Phase III introduces a Redial soft key for M3903, M3904, and M3905 sets. Press either the soft key or the programmable feature key to go directly to the Redial List.

The default soft key assignment for the Redial List is 28. However, if the system administrator configures a Redial List programmable feature key, the Redial List soft key is automatically removed. If necessary, the system administrator can add the soft key back on the predefined soft key number.

Password protection applies to One-Button Feature Access to the Redial List. If the password is enabled, when you press the Redial List soft key, a prompt appears requesting password entry. Once you enter the correct password, you can access the Redial List.

Pause in Dialing String

With M3900 Phase III, M3902, M3903, M3904, and M3905 sets support a pause in dialing. This pause is often required when a user dials remote devices, such as answering machines, Interactive Voice Response (IVR) systems, auto attendants, and tandem switches.

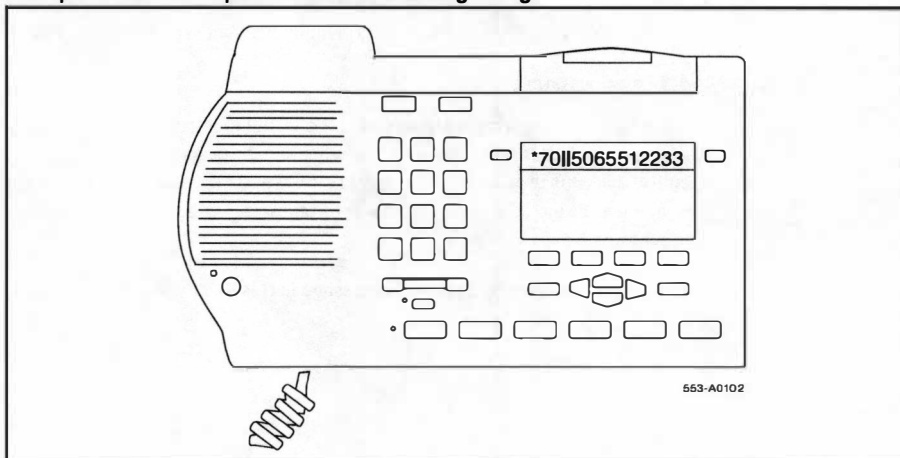
The Pause feature enters a 1.5-second delay in a dialing sequence. The user can add the delay while programming or editing an entry in the Personal Directory, Callers List, Redial List, and Predial List.

This feature introduces a Pause soft key. To enter a Pause in the dialing string while editing a number, press the Pause soft key. A Pause place marker appears in the dialing string. The place marker appears as two parallel bars, and takes up one space in the dialing string.

Note: You can enter multiple pauses for longer delays.

Figure 1

Example of the Pause place marker in a dialing string



Special Character Support

With M3900 Phase III, M3902, M3903, M3904, and M3905 sets support all special characters found on a PC keyboard. Special character support allows a user to input special characters when using the edit mode in the Personal Directory and Set-to-Set Messaging. For example, a user can enter a name with an accent in their Personal Directory (for example, Josée).

Special Character Support also supports “Change feature key labels” in the Options menu.

The special character set includes all characters from the extended portion of the ASCII character set. The extended ASCII character set that supports the set's current language is the character set that appears in the edit mode. The special character set contains up to 130 characters. It is displayed in six lines with 24 characters on each line. Use the navigation keys to scroll through the list or to move through an individual 24-character line.

The special character set does not include upper- and lower-case letters or numerals. Use the keypad of the set to define these characters.

M3900 Headset State Support

The M3903, M3904, and M3905 sets support the use of a headset. With M3900 Phase III, for the headset to operate, the system administrator no longer has to set the Class of Service to Handsfree Allowed (HFA) in LD 11.

Set-to-Set Messaging

The Set-to-Set Messaging feature provides a visual message from one M3900 telephone to another M3900 telephone when a user makes a call to that telephone. The user on an M3903, M3904, or M3905 set enters the Set-to-Set message text at the telephone. Set-to-Set Messaging is accessed through the Applications Key.

The maximum length for Set-to-Set message text is 24 characters (one line of the set display).

Table 3
Sample of Message Text

OUT TO LUNCH
BACK TO WORK: 4 Dec 99
BACK TO OFFICE: Jan 00
WILL REPLY AFTER 1 PM
BACK @ 4:00 PM
NOT IN TODAY
RETURN SOON -- 8:10 AM
GONE FOR THE DAY

The user can have only one Set-to-Set message on their telephone at a time. To activate Set-to-Set Messaging, the user must first define a message. If password protection is active for the M3900, it also applies to Set-to-Set Messaging.

If the Multiple Appearance Redirection Prime (MARF) feature is active, then MARF determines which DNs receive the Set-to-Set message. If MARF is not active, then Multiple Appearance Directory Number (MADN) determines which DNs configured on the telephone receive the Set-to-Set message.

To use Set-to-Set Messaging the M3903 or M3904 telephone must have:

- the Set-to-Set feature Class of Service enabled in LD 11
- a Set-to-Set message text created
- the Set-to-Set Messaging feature enabled

When Set-to-Set Messaging is active, the caller hears an audible tone and the Set-to-Set Message appears on their display. The caller then hears ringback and the call goes to voice messaging. If the called set is busy, a call waiting tone is heard by the called party.

Set-to-Set Messaging Enhancements for Phase III sets allow the system administrator to predefine ten messages for the M3903, M3904, and M3905 sets. The telephone user can select one of the messages as their set-to-set message. The telephone user can also edit a message before selecting it as their set-to-set message.

When the system administrator chooses the system-initiated language for the M3900 sets, the list of ten predefined set-to-set messages for that language is loaded into memory from the hard disk.

When the predefined messages are in memory, the system administrator can customize them for a particular customer group.

Note: Each customer group on the Meridian 1 system can have its own default language and list of predefined set-to-set messages for its end users.

When a set has Set-to-Set Messaging Allowed (STSA) Class of Service defined, the user can select and edit any of the ten messages listed in Table 3. However, only one of the messages is stored as the user's set-to-set message.

The user presses the Up and Down navigation keys to scroll through the list of predefined messages. When scrolling down, the list wraps from message ten to message one. When scrolling up, the list wraps from message one to message ten.

Table 4
Predefined set-to-set messages

Message #	Message
1	Please leave message
2	Back to work
3	In a meeting
4	On a conference call
5	At lunch
6	Busy, call

Message #	Message
7	Out of the office today
8	On a business trip
9	Project deadline today
10	Will reply after

With M3900 Phase III, the Set-to-Set Messaging screen has three soft keys. The ON/OFF key toggles the Set-to-Set Messaging feature on or off. The ON/OFF key only appears if the currently displayed message is saved. The Edit key allows the user to customize the message displayed on the screen. The Select soft key appears only if the currently displayed message is not saved. When pressed, this soft key selects the currently displayed message as the set-to-set message to be stored.

Set-to-Set Messaging Enhancements introduces a Message (Msg) field. This field contains either the number of the displayed message or the word "Saved". The system saves only one message. A message is saved when the user does one of the following:

- highlights a message and then presses Select
- edits a message and then presses Done

Note: When the user performs one of the above, the new message overrides any previously saved messages.

When the user edits a message, the modified message is displayed when the user scrolls through the list. However, if the user then edits another message, that message replaces the previously modified message.

One-Button Feature Access to Corporate Directory

With One-Button Feature Access, users have more direct access to the Corporate Directory.

Press the Applications key to access the corporate Directory on M3903, M3904, and M3905 sets. With M3900 Phase III, you do not have to press the Select key after pressing the Applications key. Once you press the Applications key, you can immediately begin a search using the dial pad keys, provided that Corporate Directory was highlighted in the Applications selection list.

Corporate Directory Search Enhancement

With M3900 Phase III, the Corporate Directory Search Enhancement introduces the Resume soft key to the Corporate Directory screens of the M3903, M3904, and M3905 sets. The Resume key allows you to return to the Corporate Directory Find screen to enter additional characters and to continue your search without starting over from the beginning.

The Resume key appears on the following Corporate Directory screens:

- List view
- Card view
- No matches found

When you press the Resume soft key, the Corporate Directory Find screen returns with the information that you previously entered. The cursor is placed after the last letter that you entered. You can enter additional letters and then press the Done soft key. This brings you to a new point in the directory.

The M3903, M3904, and M3905 telephones provide access from the telephone to a corporate wide directory. The Corporate Directory is accessed through the Applications Key. The Corporate Directory allows:

- users to search by name
- a user to view additional information on each entry
- the user to dial from the Corporate Directory
- the user to copy and paste an entry into the Personal Directory (M3904 and M3905)

- an alphabetical listing of entries by using the last names (system generated)

Note: When names are copied to the Personal Directory (M3904 and M3905), the names are listed by first name.

- the system administrator to configure Meridian Administration Tools (MAT) to download the directory database manually or automatically to the system

Operating parameters for the Corporate Directory

The user must have an M3903, M3904, or M3905 telephone to support the Corporate Directory feature. To access the Corporate Directory from the telephone, the user must have the Corporate Directory Class of Service enabled.

When the Corporate Directory is being updated with new data, the user cannot access the Corporate Directory. The user exits the Corporate Directory by pressing the Quit Key or the Applications Key.

The MAT or Optivity Telephony Manager (OTM) Corporate Directory utility gathers data from the MAT or OTM databases and downloads it to the Meridian 1 system. To use the Corporate Directory utility, MAT 6.6 or OTM 1.0 or later must be installed. For Release 25.40, OTM must be used.

Virtual Office

The Virtual Office feature allows users to log in to a designated M3903 or M3904 telephone and use their individual telephone configurations at that telephone. The calls to the user's primary DN are routed to the Virtual Office Host Terminal where the Virtual Office Worker is logged in.

The Host Terminal is the physical telephone that a user can use to log in as a Virtual Office worker. Both the M3903 and M3904 can be configured as Host Terminals; however, a Virtual Office Worker is required to login to a Host Terminal that matches their Virtual Terminal set type. For example, when the Virtual Terminal of a Virtual Office Worker is configured as an M3904, the login process is blocked if they attempt to login to an M3903 Host Terminal.

The Virtual Terminal is a set of features configured for a user and defined on a phantom loop. There is no permanent physical telephone associated with a Virtual Terminal.

The Virtual Office recognizes all system configuration related to the Virtual Office Worker. The Virtual Office feature operates on stand-alone Meridian 1 systems only.

Only one active session per user login ID is allowed at one time in the system. The Virtual Office Worker is identified by their primary DN, which cannot be used as the primary DN for any other set, virtual or physical, in the system. Use the Station Control Password (SCPW, configured in overlay 11), to validate the login.

Nortel Networks recommends that the Host Terminal have at least internal call and emergency call (911 in North America) capability.

Clearing of the Directory Services Password

With M3900 Phase III, the Meridian 1 system clears the Directory Services password when a virtual office worker logs in or out of an M3903 or M3904 Host set. The system administrator configures this functionality by defining Class of Service as Erase List Allowed (ELA) in Overlay 11 for the M3903 or M3904 Virtual set.

This Clearing of Password functionality allows multiple virtual workers, using the same host set, to have access to password-protected features if one of the users sets the password and does not turn it off when they log out.

Clearing of the Callers List and Redial List

With M3900 Phase III, the Meridian 1 system clears the Redial and Callers lists when a virtual office worker logs in or out of an M3903 or M3904 Host set. The system administrator configures this functionality by defining Class of Service as Erase List Allowed (ELA) in Overlay 11 for the M3903 or M3904 Virtual set. When the ELA Class of Service is defined, the Callers List and Redial List are automatically cleared when the virtual worker logs in or out.

Automatic Logout for Virtual Office

M3900 Phase III introduces automatic logout for virtual workers. If a virtual worker, who is already logged on to Set A, tries to log on to Set B, the system automatically logs the virtual worker off Set A and logs them on to Set B (provided that the virtual worker enters the correct login password). The system administrator enables this functionality in Overlay 15 at the Virtual Office Automatic Logout (VO_ALO) prompt.

The system administrator can also define a time at which all virtual terminals are automatically logged out. The system administrator configures the automatic logout time at the Virtual Office Automatic Logout Time (VO_ALOHR) prompt in Overlay 15.

If the set is busy at the automatic logout time (for example, if the virtual worker is using Corporate Directory or Set-to-Set Messaging), it is not logged out until it becomes idle.

Note: If a user logs in to a virtual set after automatic logout, the set does not automatically log out a second time.

Speed Call for Virtual Office

With M3900 Phase III, M3900 sets support Speed Call (SCU/SCC) and System Speed Call (SSU only) on Virtual Terminal Numbers.

Operating parameters for Virtual office

The Virtual Terminal Prime DN cannot be a Primary DN on another terminal.

The Virtual Terminal Prime DN (user A) can be the secondary DN of another Virtual Terminal (user B).

If both user A and user B are logged in, a call to user A's Primary DN can be answered by user B's Secondary DN.

If virtual user A logs out, user B logs in, and a user calls the Primary DN of set A, the scenarios are as follows:

- If user A has Call Forward configured before logout, the call is forwarded.

- If user A does not have Call Forward configured, but has the default Call Forward (DCFW) configured, the call is forwarded to that DN (the DN can be Meridian Mail).
- If neither of the above two scenarios apply, the caller receives overflow tone.

Display-based Expansion Module

The Display-based Expansion Module is an accessory that provides a single strip of eight additional keys for the M3904 and M3905 telephones. The user presses the Page Key on the Display-based Expansion Module to access three different layers of keys. A single Display-based Expansion Module can be configured to provide up to 24 soft-labeled programmable feature or DN keys (eight keys on each of the three layers).

Flash Download

Flash Download provides the ability to download a new version of firmware from the Meridian 1 to a single M3900 Series telephone, or to a range of M3900 Series telephones. For X11 Release 25, this feature is applicable to M3902, M3903, M3904, and M3905 telephones. Flash Download enables firmware upgrades without the necessity of replacing the telephones in the field, thereby “future-proofing” the M3900 Series telephones.

System-Initiated Language Download

For the initial system-initiated language download, if the system administrator chooses a language that is not supported by one of the sets, the language selection remains at the default (English). When the system administrator chooses an unsupported language, an error message appears on the TTY.

Set-to-Set Messaging

If the system administrator chooses a language and the file containing the ten predefined messages for that language cannot be found on the hard disk, the list of messages stored in memory will be completely blank. The system administrator can still create a list of customized messages in the same manner as if they were only modifying one or two of the predefined messages.

When the administrator enters Yes at the STS_MSG prompt in overlay 15, the prompt MSG xx appears (Where xx=01~ 10) and this predefined default message will not be printed out in overlay 15. The administrator can update the message or press the Enter key to accept the default message. The administrator can print out the messages in overlay 21 after the changes are made in overlay 15. A message can be deleted by typing X and pressing the <CR> key. This piece of message then becomes empty.

Language selection during software installation

With X11 Release 25, the software installer has been given the ability to select one of the following language sets to be installed on the Meridian 1. This selection determines the languages available to M3900 Series telephone users.

- Global 10 Languages (Release 3)—English, French, German, Spanish, Swedish, Italian, Norwegian, Brazilian Portuguese, Finnish, Japanese Katakana
- Western Europe 10 Languages (Release 3)—English, French, German, Spanish, Swedish, Norwegian, Danish, Finnish, Italian, Brazilian Portuguese
- Eastern Europe 10 Languages (Release 3)—English, French, German, Dutch, Polish, Czech, Hungarian, Russian, Latvian, Turkish
- North America 6 Languages (Release 3)—English, French, German, Spanish, Brazilian Portuguese, Japanese Katakana
- Spare Group A
- Spare Group B

During the software installation process, the installer selects one of the above Peripheral Software DownLoad (PSDL) files. Please see *Software Conversion Procedures* (553-2001-320) for information on software installation.

General features

The specific characteristic of the five models of the M3900 Series telephones is found on the following pages. Refer to:

- “M3901” on page 36

- “M3902” on page 37
- “M3903” on page 39
- “M3904” on page 41
- “M3905” on page 43

The M3900 Series Meridian Digital Telephones support features through:

- Fixed Feature Keys
- Programmable Line/Feature Keys (self-labeled)
- Programmable Soft Keys (self-labeled) (M3902 and M3905)
- Context Sensitive Soft Keys (M3903, M3904, and M3905)
- Applications Key
 - Set-to-Set Messaging (M3903, M3904, and M3905)
 - Corporate Directory (M3903, M3904, and M3905)
- M3900 “Hardware options” on page 45

Feature keys

Personal Directory

With M3900 Phase III, press the Directory/Log fixed feature key to access the Personal Directory on M3904 sets. On M3905 sets, press the Directory self-labelled programmable feature key. You do not have to press the Select key after pressing the Directory/Log or DIR/LOG key. Once you press the Directory/Log or DIR/LOG key, you can immediately begin a search using the dial pad keys, provided that Personal Directory was highlighted in the selection list.

Note: M3900 Phase III allows you to perform a three-letter search in the Personal Directory.

The Fixed Feature Keys (see Table 5) are the feature keys on the M3900 Series Meridian Digital Telephone that are prelabeled with the assigned feature. The Fixed Feature Keys appear on the telephone with text or icon labels. Telephones with icon labels are only available in specific market areas.

Table 5
Fixed Feature Key text and icon labels (Part 1 of 3)

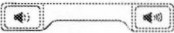
Feature	Text Key Label	Icon Key Label
Goodbye		
Hold		 or 
Mute		
Handsfree		
Volume		
Headset		
Options		
DN line		
Feature (M3901)		
Message		
Directory/Log (M3904)		

Table 5
Fixed Feature Key text and icon labels (Part 2 of 3)

Feature	Text Key Label	Icon Key Label
Call Log (M3903)		
Shift		
Application		
Navigation		
Copy		
Quit		
Transfer (M3902)		
InCalls (M3905 Call Center)		
Not Ready (M3905 Call Center)		
Make Busy (M3905 Call Center)		
Call Supervisor (M3905 Call Center)		
Answer Agent (M3905 Call Center)		
Activity Code (M3905 Call Center)		
Answer Emergency (M3905 Call Center)		

Table 5
Fixed Feature Key text and icon labels (Part 3 of 3)

Feature	Text Key Label	Icon Key Label
Emergency (M3905 Call Center)		
Observe Agent (M3905 Call Center)		
Display Queue (M3905 Call Center)		

Note: Icon key labels are available in specific markets areas.

Programmable Line/Feature Keys (self-labeled)

The Programmable Line/Feature Keys (self-labeled) are the keys located at the left and right sides of the upper section of the display area. The user can change the LCD label of these keys (with the exception of the primary Directory Number Key) to meet their business needs.

The Programmable Line/Feature Key (self-labeled) provides two layers of functionality on the M3903 and M3904. The two layer keys on the M3903 and M3904 provides the user access to two Lines/Features per key. For example, the M3904 has six Programmable Line/Feature Keys (self-labeled), which provide the user with 12 line/feature keys accessible on the six keys.

Soft Keys (self-labeled)

The Soft Keys (self-labeled) are the three (M3902) or four (M3903, M3904, and M3905) keys located below the display on the M3900 Series Meridian Digital Telephones. The labels and corresponding functionality of these keys change depending on the features available or the application in use.

Programmable Features

The M3901 can have five Programmable Features assigned. The user activates the features by pressing the Feature Key and assigned key pad keys as indicated by the Feature Card. The system administrator programs selected features for the M3901 telephone.

For feature key assignment information see:

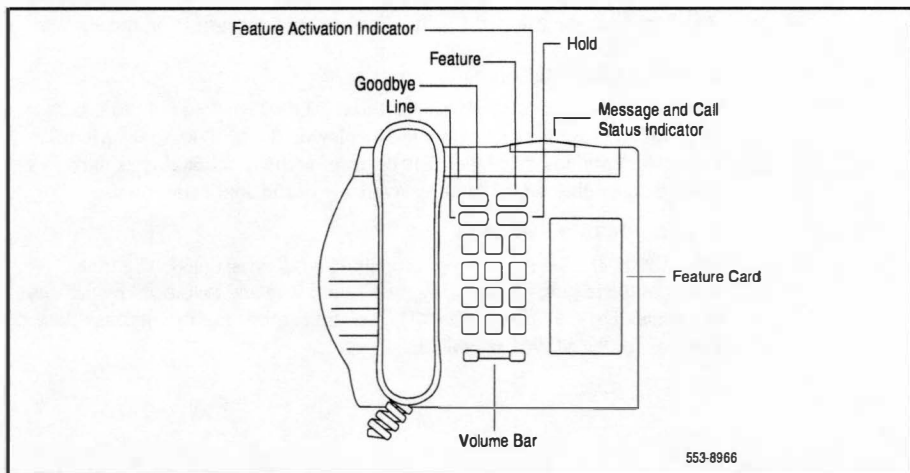
- Table 8, “M3901 key description,” on page 74
- Table 9, “M3902 key description,” on page 76
- Table 10 “M3903 key description” on page 77
- Table 11 “M3904 key description” on page 80
- Table 12 “M3905 key description” on page 83

M3901 Entry Telephone

The features of the M3901 include:

- one line (Directory Number (DN)) capability
- five programmable features
- Fixed Feature Keys: Line, Feature, Hold, Goodbye, and Volume control
- Feature Activation and Message Waiting/Incoming Call Status Indicator LED
- support for an amplified headset

Figure 2
M3901

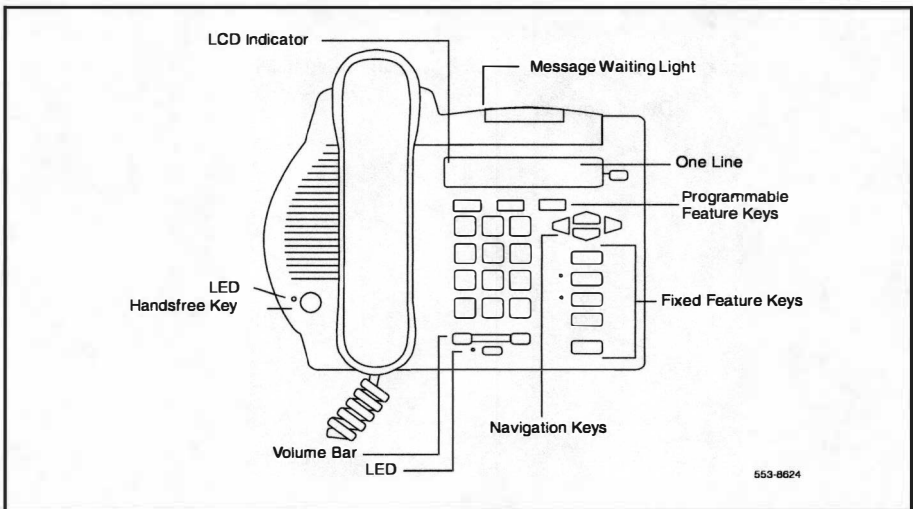


M3902 Basic Telephone

The features of the M3902 include:

- one line (Directory Number (DN)) capability
- three Programmable Soft Keys (self-labeled)
- Fixed Feature Keys: Options, Message, Transfer, Goodbye, Hold, "Smart" Mute, and Volume control
- two lines by twenty-four character display area
- Group Listening
- on-hook dialing
- support for an amplified headset
- one accessory port
- handsfree calling option with LED

Figure 3
M3902

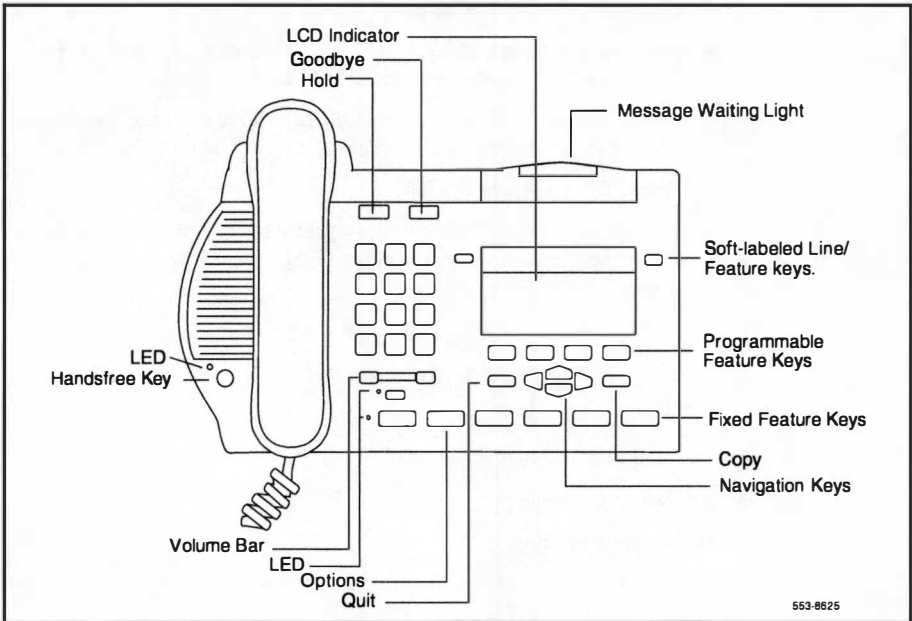


M3903 Enhanced Telephone

The features of the M3903 include:

- two Programmable Line/Feature Keys (self-labeled) which have two layers each, giving the user access to four Line/Feature keys
- four Context Sensitive Soft Keys (self-labeled) that change functionality depending on the features available or the application in use
- Handsfree calling with LED
- Fixed Feature Keys: Goodbye, Message, Call log (including Redial List), Applications, Shift, Goodbye, Hold, "Smart" Mute, and volume control
- Navigation cluster, Quit, and Copy
- three line by twenty-four character display area
- Call Log (includes Redial List)
- Group Listening
- on-hook dialing
- two accessory ports
- support for an amplified or unamplified headset
- Direct Connect Headset port

Figure 4
M3903

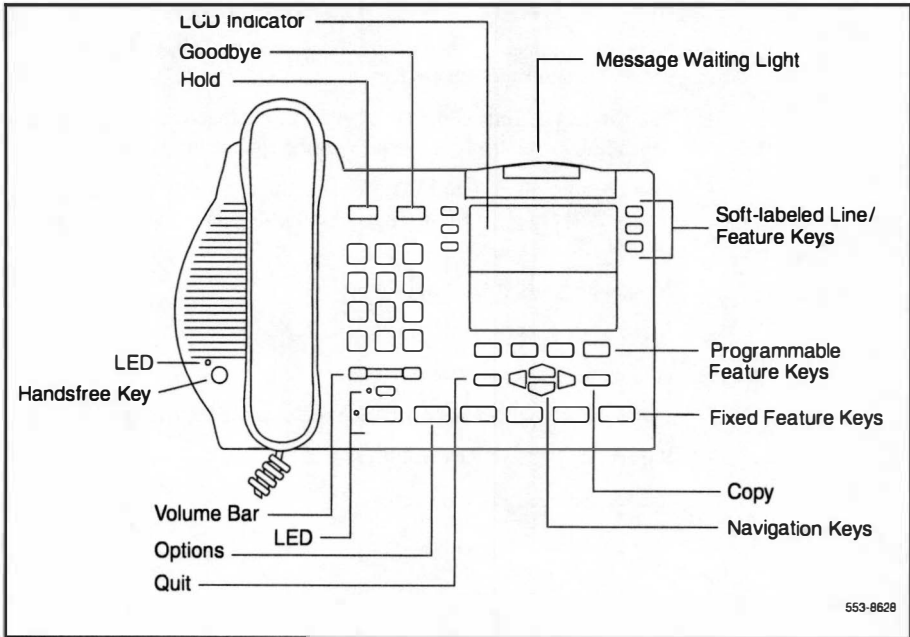


M3904 Professional Telephone

The features of the M3904 telephone include:

- six Programmable Line/Feature Keys (self-labeled) which have two layers each, giving the user access to 12 Line/Feature keys
- four Context Sensitive Soft Keys (self-labeled) that change functionality depending on the features available or the application in use
- Handsfree Calling with LED
- Fixed Feature Keys: Options, Message, Directory/Log (including Redial List), Applications, Shift, Goodbye, Hold, "Smart" Mute, Volume control
- Navigation cluster, Quit, and Copy
- five line by twenty-four character display
- Personal Directory
- Call Log (includes Redial List)
- Group Listening
- on-hook dialing
- two accessory ports (support for an amplified/unamplified headset)
- Direct Connect Headset port

Figure 5
M3904

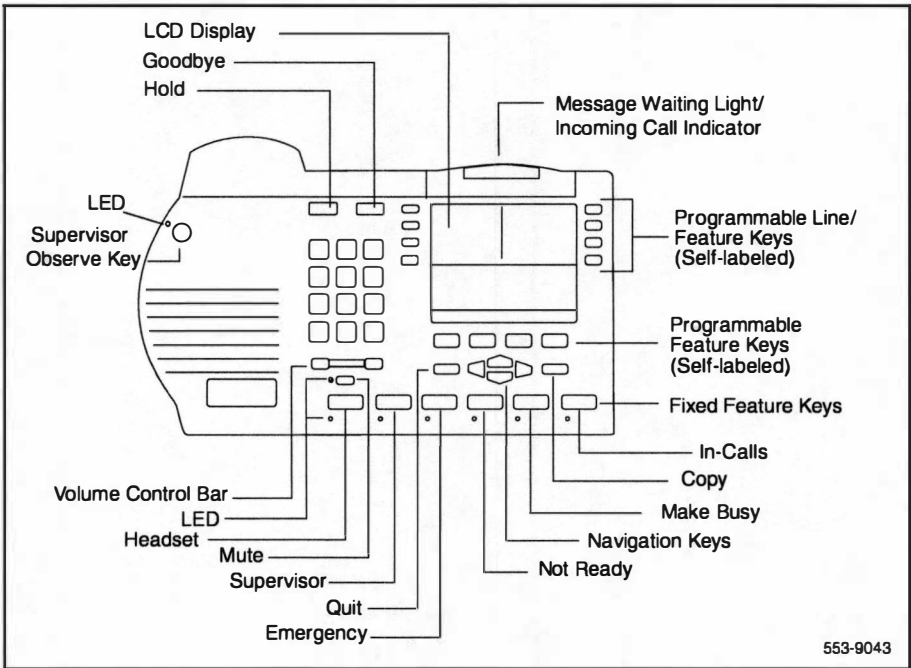


M3905 Call Center Telephone

The features of the M3905 Call Center Telephone include:

- eight Programmable Line/Feature Keys (self-labeled), giving the user access to eight Line/Feature Keys
- four Context Sensitive Soft Keys (self-labeled) that change functionality depending on the features available or the application in use
- Fixed Feature Keys with LED: Headset, Supervisor, Emergency, Not Ready, Make Busy, In-Calls, goodbye, Hold, “Smart” Mute, Volume control
- Navigation cluster, Quit and Copy
- four line by twenty-four character display
- an optional handset
- two accessory ports (supports amplified/unamplified headset)
- Supervisor Observe Key with LED
- Supervisor Headset Observe port

Figure 6
M3905



Note: The system administrator can configure four of the bottom six Fixed Feature Keys (Make Busy, Not Ready, Supervisor and Emergency) to Feature Keys that suit the business needs of the Call Center user.

Hardware options

Contents

The following are the topics in this section:

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Description

Table 6 lists the features and optional hardware available for each M3900 series telephone.

Table 6
M3900 Series telephone accessories compatibility (Part 1 of 2)

Accessory	X11 release introduced	M3900 phase introduced	M3902	M3903	M3904	M3905
Accessory Connection Module (ACM)			NA	Supports	Supports	Supports
Analog Terminal Adapter (ATA)	Release 24.24	Phase 1	Supports	Supports	Supports	Supports
Computer Telephony Integration Adapter (CTIA)	Release 25.40	Phase 3	Supports	Supports	Supports	Supports ¹
Display-based Expansion Module (DBA)	Release 25.10	Phase 2	NA	NA	Supports	Supports ¹
Key-based Expansion Module	Release 24.24	Phase 1	NA	Supports	Supports	NA
External Alerter and Recording Interface	Release 24.24	Phase 1	Supports	Supports	Supports	Supports
Full Duplex Handsfree	Release 25.40	Phase 3	Supports	NA	NA	NA
Personal Directory PC Utility	Release 24.24	Phase 1	Supports	Supports ¹	NA	NA
Headset (non-amplified) connects thought he direct connect headset jack			NA	NA	Supports	Supports

Table 6
M3900 Series telephone accessories compatibility (Part 2 of 2)

Accessory	X11 release introduced	M3900 phase introduced	M3902	M3903	M3904	M3905
Headset (amplified) connects through the headset jack			Supports	Supports	Supports	Supports
Handset			Standard	Standard	Standard	Standard
<i>Note 1:</i> M3905 Phase III firmware and X11 Release 25.40 or later software are required to support the Personal Directory PC Utility, DBA, and CTIA accessories.						

Accessory Connection Module (ACM)

The Accessory Connection Module provides the interface for adding the Analog Terminal Adapter, External Alerter and Recorder Interface, Computer Telephony Integration Adapter, and Personal Directory PC Utility. The ACM is available for the M3902, M3903, M3904 and the M3905. The ACM requires a wall transformer to power any of the accessory cartridges. You must order the wall transformer separately from your Nortel Networks distributor to power the ACM and/or the M3900 accessories.

Table 7
Accessory compatibility (Part 1 of 2)

	ATA	Key-based Expansion Module	Personal Directory PC Utility	External Alerter and Recording Interface	Display- based Expansion Module	CTIA
Analog Terminal Adaptor (ATA)	NA	YES	YES	YES	YES	YES
Key Expansion Module (2)	YES	NA	YES	YES	NO	YES

Table 7
Accessory compatibility (Part 2 of 2)

	ATA	Key-based Expansion Module	Personal Directory PC Utility	External Alerter and Recording Interface	Display- based Expansion Module	CTIA
Personal Directory PC Utility	YES	YES	NA	YES	YES	YES
External Alerter and Recording Interface	YES	YES	YES	NA	YES	YES
Display Expansion Module (1)	YES	NO	YES	YES	NA	YES
Computer Telephony Integration Adapter (CTIA)	YES	YES	YES	YES	YES	NA
Full Duplex Handsfree	YES	NA	YES	YES	NA	YES
Note: Not all of the above accessories are supported on all telephones in the M3900 Series portfolio.						

Alternate key caps for the M3905

The M3905 Call Center Telephone provides an alternate key cap kit to customize your M3905 telephone to fit your business needs. Use the Key Cap Tool to remove any of the middle four fixed programmable keys, located at bottom front of the M3905, and replace them with alternate keys. The alternate key caps include: Answer Emergency, Answer Agent, Activity Code, Call Agent, Observe Agent, and Display Queue.

Analog Terminal Adapter (ATA)

The Analog Terminal Adapter (ATA) lets you connect an analog device such as a fax machine or modem to your telephone. You can have simultaneous use of the telephone and the analog device. The ATA is available for the M3902, M3903, M3904 and the M3905 models.

Computer Telephony Integration Adapter (CTIA)

The Computer Telephony Integration Adapter (CTIA) along with the TAPI software provides an interface to connect a Personal Computer (PC) to the M3900 telephone.

An RS-232C cable is required to connect the PC to the CTIA. The CTIA connects to the M3900 Series telephone through the Accessory Connection Module (ACM). The CTIA is a small cartridge accessory and can be inserted into either the small or large footstand opening.

The CTIA is powered through the ACM. The ACM receives power through the telephone via the telephone line cord which is connected to a Teladapt wall transformer power supply (see Figure 13 on page 93). Check with your Nortel Networks distributor for the recommended wall transformer for the M3900 accessories. Install the Accessory Connection Module (ACM) into your M3900 Series Meridian Digital Telephone (refer to the ACM Installation Sheet) before you install your CTIA.

The CTIA cartridge provides the user:

- connectivity to the PC
- voice call control

Telephone Application Programming Interface (TAPI) software

TAPI software accompanies your CTIA Cartridge. The TAPI software allows a user to program telephone-line-based devices to work independently from their computer or other devices.

Personal Directory PC Utility Software

In addition to the TAPI software which is included with the CTIA, you may wish to purchase the Personal Directory PC Utility Software. The Personal Directory PC Utility software uses your CTIA Cartridge to connect your PC and M3904 telephone so that you may exchange data between your PC and your telephone's directory. For more information see Personal Directory PC Utility.

Personal Directory PC Utility

The Personal Directory PC Utility software provides a faster, easier way to create or modify a Personal Directory on the M3904 and M3905 telephones. You can enter names and numbers into a Personal Directory file on your Personal Computer (PC). You can download (program) the PC file directly to the M3904 and M3905 telephones. You can upload (read) a directory from the M3904 and M3905 telephones to your PC to modify the directory.

An RS-232C cable is required to connect the PC to the Personal Directory PC Utility Interface Cartridge. The cartridge connects to the M3900 Series telephone through the Accessory Connection Module (ACM). The Personal Directory PC Utility Interface Cartridge is a small cartridge accessory and can be inserted into either the small or large footstand opening.

The Personal Directory PC Utility Interface Cartridge is powered through the ACM. The ACM receives power through the telephone via the telephone line cord which is connected to a Teladapt wall transformer power supply (see Figure 13 on page 93). Check with your Nortel Networks distributor for the recommended wall transformer for the M3900 accessories. You must install the Accessory Connection Module (ACM) into your M3900 Series Meridian Digital Telephone (refer to the ACM Installation Sheet) before you install your Personal Directory PC Utility Interface Cartridge.

Note: The CTIA Cartridge and the Personal Directory PC Utility Interface Cartridge are identical.

The Personal Directory PC Utility supports the following languages: English, French, Spanish, German, Danish, Portuguese, Italian, Norwegian, Swedish, Finnish, Dutch. The default language is English.

Expansion Modules

Display-based Expansion Module

The Display-based Expansion Module (DBA) provides additional Line/Programmable Feature Keys (Self-labeled) for the M3904 and M3905. The DBA supports up to three layers of eight additional keys for a total of 24 keys.

Note: Refer to Table 7 on page 47 for a list of the telephones with which the Display-based Expansion module is compatible.

A Page fixed key located on the DBA allows a user to switch between the three layers of Self-labeled Programmable Feature Keys. Visual indication is also provided to indicate which page (or layer) of Self-labeled Programmable Feature Keys is in use. Feature activation and deactivation on the DBA Keys is the same as the Programmable Feature Keys on the M3904 and M3905.

The user may change the feature key labels by selecting "Change feature key label" from the Options List on the M3904 or M3905.

The Display-based Expansion Module is only supported on the M3904 and M3905. You can attach a maximum of one Display-based Expansion Module to an M3904 or M3905 set.

Key-based Expansion Module

The Key-based Expansion Module (KBA) attaches to the M3904 and M3905 Meridian Digital Telephones. The KBA provides 22 additional Line/Feature Keys. You can attach a maximum of two Key-based Expansion Modules to the M3904 and M3905.

External Alarmer and Recording Interface

The External Alarmer and Recording Interface provides an interface for a remote ringer device installed in a location separate from the telephone. The External Alarmer and Recording Interface provides access to a standard, off-the-shelf remote ringer, call status relay, audio recorder or visual indicator.

You can program the External Alarmer interface to activate a ringer (or light) when the telephone rings or when the telephone is in use (off hook).

Note: The External Alserter is an interface only, the ringer, light, buzzer etc. is available through a third party vendor.

Handset option for the M3905 Call Center Telephone

The Handset does not accompany the M3905 Call Center Telephone. The Handset kit is a hardware option for the M3905 Call Center Telephone. The handset can be added to the M3905 by removing the front plate of the telephone. A handset kit is available for the M3905.

Headset options

The M3901, M3902, M3904, and M3905 supports an amplified headset when the headset connects to the handset jack.

The M3903, M3904 and M3905 have a dedicated headset jack which supports a non-amplified headset. The M3903, M3904 and M3905 have a Headset Fixed Feature Key to turn the Headset on and off.

Contact your Nortel Networks distributor for recommended headset equipment.

Telephone Wall Mount Kit

The telephone wall mount bracket kit contains a one piece wall mount plate that attaches the M3903, M3904 and M3905 telephone to the wall. The Wall Mount Kit is available from your local Nortel Networks distributor. The M3901 and M3902 have built in wall mount brackets.

Full Duplex Handsfree

The Full Duplex Handsfree (FDHF) functionality allows simultaneous two-way communication during a handsfree call. For Full Duplex Handsfree functionality, you require an M3904 Phase III set equipped with an FDHF cartridge.

The FDHF functionality requires the following hardware:

- M3904 Phase III set (NTMN34GA)

Note: NTMN34TA is the M3904 Phase III Icon set.

- Full Duplex Handsfree cartridge (NTMN72AA)

- Accessory Connection Module (ACM) (NTMN71AA)
- One of the following wall transformers to power the FDHF cartridge:
 - 110V wall transfer (NTMN80AA)
 - 220V wall transformer (NTMN80BA)
 - EU 230V wall transformer (NTHC08AA)
 - UK 230V wall transformer (NTHC09AA)

Configure the M3900 Series Meridian Digital Telephone

Contents

The following are the topics in this section:

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Reference list

The following are the references in this section:

- *Administration* (553-3001-311)
- *Maintenance* (553-3001-511)
- *System Messages Guide* (553-3001-411)

Description

To configure the M3900 Series Meridian Digital Telephones and related features, follow the procedures in the following tables:

- “LD 11 – Configure the M3900 Series Digital Telephone,” on page 57
- “LD 11 – Configure the Server-based Applications (Corporate Directory and Set-to-Set Messaging),” on page 65
- “LD 32 – Clear Personal Directory Password for M3900 set,” on page 66
- “LD 57 – Configure the Flexible Feature Codes for the Virtual Office feature,” on page 67
- “LD 97 – Configure a Phantom loop for the Virtual Office feature,” on page 68
- “LD 20 – Print Terminal Number Block (TNB) data for Virtual and Host Terminals,” on page 69
- “LD 22 – Print request for peripheral software versions,” on page 69
- “LD 97 – Configure parameters for System-wide Flash Download,” on page 70
- “LD 32 – Flash Download commands,” on page 73

Note 1: The (...) within the table indicate additional prompts not shown.

Note 2: For more information refer to *X11 Administration* (553-3001-311), *X11 Maintenance* (553-3001-511), and *X11 System Messages Guide* (553-3001-411).

Configure the M3901, M3902, M3903, M3904, and M3905 telephone

LD 11 – Configure the M3900 Series Digital Telephone (Part 1 of 4)

Prompt	Response	Description
REQ:	NEW	New data.
	CHG	Change current data.
TYPE:	x..x	Type of telephone. 3901 = M3901. 3902 = M3902. 3903 = M3903. 3904 = M3904. 3905 = M3905. 3903H = M3903 Host Terminal. 3904H = M3904 Host Terminal. 3903V = M3903 Virtual Terminal. 3904V = M3904 Virtual Terminal. Note 2: The M3903, M3904, and 3905 telephones only support the Host Terminal and the Virtual Terminal feature. Note 3: If the M3901, M3902 or M3905 are configured as a Virtual Terminal, the error message SCH0099 is output. Note 4: M3903, M3904, and M3905 are the telephone types supported for Corporate Directory and Set-to-Set Messaging.
TN		Terminal number.
	l s c u	l = loop address. If confirmed as 3903V or 3904V, the loop must be a phantom. If confirmed as 3903H or 3904H, the loop must NOT be a phantom s = shelf address. c = card address. u = unit address.
	c u	For Option 11C, input only the card and unit address. If confirmed as 3903V or 3904V the card must be a phantom (card slots 61-80). Note: If the telephone has an Analog Terminal Adapter (ATA), then use the voice Terminal Numbers 16-31.
...	...	...

LD 11 – Configure the M3900 Series Digital Telephone (Part 2 of 4)

Prompt	Response	Description
DES	d...d	Designator. d...d = represents an Office Data Administration System (ODAS) Station Designator of 1-6 alphanumeric characters.
...	...	...
CUST	xx	Customer number as defined in LD 15.
...	...	...
KBA	(0)-2	Key-based Expansion Module accessory (configuration prompt KBA). The KBA prompt appears when the set type is M3904 or M3905. 0 = allows configuration of up to and including key number 31. 1 = allows configuration of up to and including key number 53. 2 = allows configuration of up to and including key number 75.
DBA	(0)-1	Display-based Expansion Module accessory (configuration prompt DBA) If KBA is a non-zero value, then DBA is not prompted. If KBA is a zero value or if the carriage return is pressed, then the DBA prompt appears. 0 = allows configuration of up to and including key number 31. 1 = allows configuration of up to and including key number 55.
FDN	xxx...x	Flexible CFNA (Call Forward No Answer) DN.
...	...	...
SCPW	xxx...x	Station Control Password.
...	...	...

LD 11 – Configure the M3900 Series Digital Telephone (Part 3 of 4)

Prompt	Response	Description
CLS	aaaa	Class of Service options where aaaa: = (GRLD) Group Listening Denied, (M3902, M3903, M3904). = GRLA Group Listening Allowed, (M3902, M3903, M3904). = (HFD) Handsfree Denied, (M3902, M3903, M3904). = HFA Handsfree Allowed (M3902, M3903, M3904). = ADD Automatic Digit Display, default for M3902, M3903, M3904, M3905. = (VCE) Voice Terminal, required if ATA equipped. = DTA Data Terminal. = (FLXD) Flexible voice/data denied. = FLXA Flexible voice/data allowed, required if ATA equipped. = (STSD) Set-to-Set Messaging Denied, (M3903, M3904, and M3905). = STSA Set-to-Set messaging Allowed, (M3903, M3904, and M3905). = (CRPD) Corporate Directory Denied, (M3903, M3904, and M3905). = CRPA Corporate Directory Allowed. (M3903, M3904, and M3905). Note 1: If ATA is equipped, CLS = FLXA, VCE required. Note 2: M3903 and M3904 must have HFA class of service for the Headset to operate.
...	...	...
DCFW	z..z	Default Call Forward DN. DN where calls are forwarded (the target DN). The maximum length of the DCFW is 31.
	x	x = remove the DCFW DN.
	<CR>	Note: The DCFW prompt appears only for Virtual Terminals (3903V, 3904V).

LD 11 – Configure the M3900 Series Digital Telephone (Part 4 of 4)

Prompt	Response	Description
KEY	xx aaa yyyy zzz	Telephone function key assignments where: xx = key number. aaa = key name or function. yyyy, zzz = additional information required. Refer to the Key description table for each M3900 telephone: "M3901 key description" on page 74. "M3902 key description" on page 76. "M3903 key description" on page 77. "M3904 key description" on page 80. "M3905 key description" on page 83. MTAD (Meridian 1 Time and Date) - The system puts a block on the time/date key on all the M3900 Series Meridian Digital Telephones. Note 1: VTN primary DN cannot be a primary DN for any other TN, and the VTN must be defined as a MARP TN. Note 2: The DN of a Virtual Terminal cannot be defined on a Host Terminal, and the Host Terminal DN cannot be defined on a Virtual Terminal.
...	...	...

Task summary list

The following is a summary of the tasks in this section:

- 5 LD 15 - Assign a default language and customize set-to-set messages.
- 6 LD 15 - Enable Virtual Office Automatic Logout and configure the automatic logout time for Virtual Office terminals.
- 7 LD 11 - Configure the Callers List and Redial List keys on Context-Sensitive Soft Keys or a Programmable feature keys.
- 8 LD 11 - Configure the default language for the M3900 set.
- 9 LD 11 - Allow or deny the erasing of the Callers and Redial lists for virtual terminals.

LD 15 – Assign a default language and customize set-to-set messages.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	FTR	Features and options.
CUST	xx	Customer number.
...		
DFLT_LANG	(ENG) FRE GER DUT SPA ITA NOR SWE DAN POR FIN POL CZE HUN JAP RUS LAT TUR	M3900 default language. English (default) French German Dutch Spanish Italian Norwegian Swedish Danish Portuguese Finnish Polish Czech Hungarian Japanese Russian Latvian Turkish
STS_MSG	(NO) YES	Modify Set-to-Set messages.
MSG 01	<CR> <text string>	Keeps current message. Input the new message to be displayed (up to 24 characters).
...		
MSG 10	<CR> <text string>	Keeps current message. Input the new message to be displayed (up to 24 characters).

LD 15 – Configure the automatic logout time for Virtual Office terminals.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	FTR	Features and options.
CUST	xx	Customer number.
...		
VO_ALO	(NO) YES	Disable Virtual Office Automatic Logout (default). Enable Virtual Office Automatic Logout.
VO_ALOHR	(0) - 23	Virtual Office Automatic Logout time. Use the 24-hour clock.

LD 11 – Configure the Callers List and Redial List keys on Context-Sensitive Soft Keys or Programmable feature keys.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:		M3900 series telephone types.
	3903H 3904H 3903V 3904V 3905	M3903 Host set M3904 Host set M3903 Virtual set M3904 Virtual set M3905 set
...		
KEY	27 CLT	Configure Callers List key on a Context-Sensitive Soft Key. CLT and NUL are the only options for KEY 27.
KEY	28 RLT	Configure the Redial List key on a Context-Sensitive Soft Key. RLT and NUL are the only options for KEY 28.

KEY	XX CLT	Configure the Callers List key on an available programmable feature key.
KEY	XX RLT	Configure the Redial List key on an available programmable feature key.

LD 11 – Configure the default language for the M3900 set.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:		M3900 series telephone types.
	3902	M3902 set
	3903H	M3903 Host set
	3904H	M3904 Host set
	3903V	M3903 Virtual set
	3904V	M3904 Virtual set
	3905	M3905 set
...		
MLNG		M3900 language selection. The default is the language selection chosen for the customer in Overlay 15. Note: The user can change the language defined at the MLNG prompt from their set.

	ENG	English
	FRE	French
	GER	German
	DUT	Dutch
	SPA	Spanish
	ITA	Italian
	NOR	Norwegian
	SWE	Swedish
	DAN	Danish
	POR	Portuguese
	FIN	Finnish
	POL	Polish
	CZE	Czech
	HUN	Hungarian
	JAP	Japanese
	RUS	Russian
	LAT	Latvian
	TURK	Turkish

LD 11 – Allow or deny the erasing of the Callers and Redial lists for virtual terminals.

Prompt	Response	Description
REQ:	NEW	Add new data.
	CHG	Change existing data.
TYPE:		M3900 series telephone types.
	3903V	M3903 Virtual set
	3904 V	M3904 Virtual set
...		
CLS	(ELD) ELA	Erase Lists (Denied)/Allowed.

Configure Corporate Directory and Set-to-Set Messaging

LD11 – Configure the Server-based Applications (Corporate Directory and Set-to-Set Messaging)

Prompt	Response	Description
REQ:	NEW	New data.
	CHG	Change current data.
TYPE:	3903 3904 3905	M3900 set types that support the Corporate Directory and the Set-to-Set Messaging.
...	...	...
CLS	aaaa	Class of Service options where aaaa: = ADD - Automatic Digit Display, default for M3903, M3904, and M3905. = (VCE), DTA - Voice Terminal, Data Terminal. = (FLXD) - Flexible voice/data Denied = FLXA - Flexible voice/data Allowed Note 1: Class of Service must be VCE, FLXA if telephone is equipped with the optional Analog Terminal Adapter. = (STSD) Set-to-Set Messaging Denied. = STSA, Set-to-Set Messaging Allowed. Note 2: STSD and STSA Class of Service applies to M3903, M3904, and M3905. = (CRPD), Corporate Directory Denied. = CRPA, Corporate Directory Allowed. Note 3: (CRPD) and CRPA class of service applies to M3903, M3904, and M3905.
...	...	...

Messaging

To clear or reset a Directory Password for the M3900 Series telephone

LD 32 – Clear Personal Directory Password for M3900 set

Prompt	Response	Description
.	CPWD l s c u	Clear Directory Password. Terminal number. l = loop address. s = shelf address. c = card address. u = unit address. Note: This Clear command allows the system administrator to clear the M3900 Directory password of the specified M3900 set. This allows a user to access the M3900 Directory if the password has been forgotten or if the user wants to change the current password.

Configure the Virtual Office Flexible Feature Codes

LD 57 – Configure the Flexible Feature Codes for the Virtual Office feature

Prompt	Response	Description
REQ	NEW	Add new data block information.
	CHG	Change data block information.
	OUT	Remove data block information.
	END	Exit data block overlay program.
TYPE	FFC	Flexible Feature Codes data block.
...	...	...
CODE	VTLN	FFC for logging a Virtual Terminal onto a Host Terminal.
	ALL	Every FFC is prompted.
	<CR>	No further prompt; returns to "REQ".
VTLN	xxxx	Enter Virtual Terminal logging code.
	<CR>	Returns to "CODE"
CODE	VTLF	FFC type for logging off a Virtual Terminal.
	ALL	Every FFC is prompted.
	<CR>	No further prompt; returns to "REQ".
VTLF	xxxx	Enter Virtual Terminal logging off code.
	<CR>	Returns to "CODE".
Note: Cannot move or copy a Virtual Terminal Number.		

Print a list or count of Virtual Office telephones

LD 81 – Print a list or count of telephones with a specified class of service or feature

Prompt	Response	Description
REQ	LST	LST = Print list of telephones.
	CNT	CNT = Print count of telephones.
CUST	xx	xx = Designates a customer number.
	xx yy	xx yy = Designates a range of customer numbers.
	<CR>	<CR> = Carriage return prints all customers.
...	...	...
FEAT	aaaa	aaaa = Designates a feature mnemonic.
	3900	3900 = Prints M3900 type terminals, including virtual and host terminals.
	DCFW	DCFW = Prints default call forward phantom TNs, including virtual terminals.
...	...	...

Configure the Virtual Office Phantom loop

LD 97 – Configure a Phantom loop for the Virtual Office feature

Prompt	Response	Description
REQ	CHG	Change the loop configuration.
TYPE	SUPL	Superloops.
SUPL	Naaa	N = designates the superloop as a phantom loop. aaa = designates the superloop number.
...	...	...

Print data for Virtual and Host Terminals

LD 20 – Print Terminal Number Block (TNB) data for Virtual and Host Terminals

Prompt	Response	Description
REQ:	PRT LTN	Print data block for the requested terminal type(s). List Terminal Numbers of the requested terminal type(s).
TYPE:	xxxxx 3903V 3904V 3903H 3904H TNB	Enter appropriate telephone model where xxxxx: 3903V = M3903 Virtual Terminal. 3904V = M3904 Virtual Terminal. 3903H = M3903 Host Terminal. 3904H = M3904 Host Terminal. Note 1: The only telephone types of the M3900 Series that can be configured as a Virtual or Host Terminal are the M3903 and M3904. Note 2: The Print TNB and List TNB requests always show the logged-off TNB data. In logged-in state, an indication of the logged-in TN ("HOST TN" or "VIRTUAL TN") is added.
...	...	...

Print M3900 firmware versions found on the system disk

LD 22 – Print request for peripheral software versions

Prompt	Response	Description
REQ:	PRT	Print
TYPE:	PSWV	Peripheral software versions on disk.

The firmware versions for each M3900 Series set type will printed along with the versions of any other downloadable peripheral software.

Configure parameters for System-wide Flash Download

LD 97 – Configure parameters for System-wide Flash Download (Part 1 of 2)

Prompt	Response	Description
REQ	CHG	Change Flash Download Parameters.
	PRT	Print Flash Download Parameters.
TYPE	FDL	Flash Download for M3900 Sets
FDTP	t <CR>	Enter M3900 set type selected for Flash Download 3902 = M3902. 3903 = M3903. 3904 = M3904. 3905 = M3905. ALL = All of the above. NONE = None of the above (default). No further prompt; returns to "REQ".
FDTM	(NO) YES <CR>	Time interval restriction for Flash Download NO = Do not change time intervals (default). YES = Proceed to change time intervals Note 1: Flash Download is automatically paused one hour before virtual midnight (see TODR in LD 17) to allow midnight routines to run. Note 2: This option is not applicable to reporting.
FDAY	dn <CR>	Enter day and number of time intervals for Flash Download. Prompt appears only if FDTM = YES Day is re-prompted until carriage return <CR> alone is entered. d = day of the week (0-6 for Sunday to Saturday) n = number of time intervals (0-4); to disallow download for the day, enter 0. Note: If two or more intervals are specified, they must be non-overlapping, non-consecutive, and in increasing order.
FINT	sl <CR>	Enter starting hour and length for a time interval. Prompted n times if n>0. s = starting hour (0-23) l = length of interval in hours (1-24)

LD 97 – Configure parameters for System-wide Flash Download (Part 2 of 2)

Prompt	Response	Description
FTNR	(NO) YES <CR>	TN range restriction option for Flash Download NO = no TN restriction (default) YES = specify TN range
FSTN	l s c u c u	Starting terminal number for Flash Download Prompt appears only if FTNR = YES.
FETN	l s c u c u	Ending terminal number for Flash Download Prompt appears only if FTNR = YES.
FDNR	(NO) YES <CR>	DN range restriction option for Flash Download NO = no DN restriction (default) YES = specify DN range
FDDN	c d1 d2 <CR>	Flash Download Prime Directory Number range Prompt appears only if FDNR = YES. c = Customer number (0-99) d1 = starting Prime DN d2 = ending Prime DN
FRCE	(NO) YES <CR>	System-wide Flash Download control option NO = Conditional (default). System-wide Flash Download (via FDLs in LD 32) applies only to an M3900 series set whose flash firmware version is different from the version currently found on the system disk YES = Forced. Force System-wide Flash Download to all of the specified M3900 series sets regardless of their current flash firmware versions. Note 1: Use this option with caution! Once the download tree is built (i.e., after executing FDLs in LD 32), this option automatically reverts to NO. Note 2: This option is not applicable to reporting.
FVER	v <CR>	Flash firmware version specified for full report v = Flash firmware version (0-99) If 0, report all versions (default). Note: This option is applicable to reporting only (via FSUM ALL in LD 32).

Configure parameters for the Full Duplex Handsfree (FDHF) functionality

LD 11 – Allow the Handsfree Class of Service.

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	3904	M3900 series telephone type. Full Duplex Handsfree functionality requires an M3904 Phase III set.
...		
CLS	HFA	Handsfree Allowed. HFD = Handsfree Denied (default).

Commands in LD 32 to support the Flash Download feature

LD 32 – Flash Download commands (Part 1 of 2)

Prompt	Response	Description
.	FDLU l s c u	Initiate conditional download to one telephone. Terminal number. l = loop address. s = shelf address. c = card address. u = unit address.
	FDLI l s c u	Initiate conditional download to an M3900 Series telephone when it becomes idle.
	FDLF l s c u	initiate a forced download to an M3900 Series telephone regardless of its version and state.
	FWVU l s c u	Query and print the firmware versions currently on an M3900 Series telephone.
	FDLS	Initiate system-wide flash download to all, or a specified type of M3900 Series telephones, based on parameters specified in LD 97
	FDLC	Cancel or gracefully stop the system-wide flash download for M3900 Series telephones.
	FSUM	Display summary report of current firmware versions on all M3900 Series telephones. The format of the report is as follows: * * M390x SUMMARY REPORT * * dd - ON DISK ff (cc) - nnnn SETS FOUND ff (cc) - nnnn SETS FOUND Where: x = 2 to 5 for M3902 to M3905 dd = the flash firmware version found on the system disk ff = the downloadable flash firmware version found on the sets cc = the core firmware found on the sets nnnn = the number of sets found with firmware version ff (cc)

LD 32 – Flash Download commands (Part 2 of 2)

Prompt	Response	Description
	FSUM ALL	Display a complete report on all M3900 Series telephones based on parameters specified in LD 97. The format of the report is as follows: TYPE: tttt CUST: cc PDN: dddddd TN: l s c u FW: vv Where: tttt = 3902, 3903, 3904 or 3905 cc = 0-99 dddddd = the Primary DN of the telephone vv = the flash firmware version

M3900 Series key descriptions

This section provides key description and key configuration information for each model of the M3900 series. This section also shows the physical placement of the keys on each model: M3901, M3902, M3903, M3904, and M3905.

M3901 key descriptions

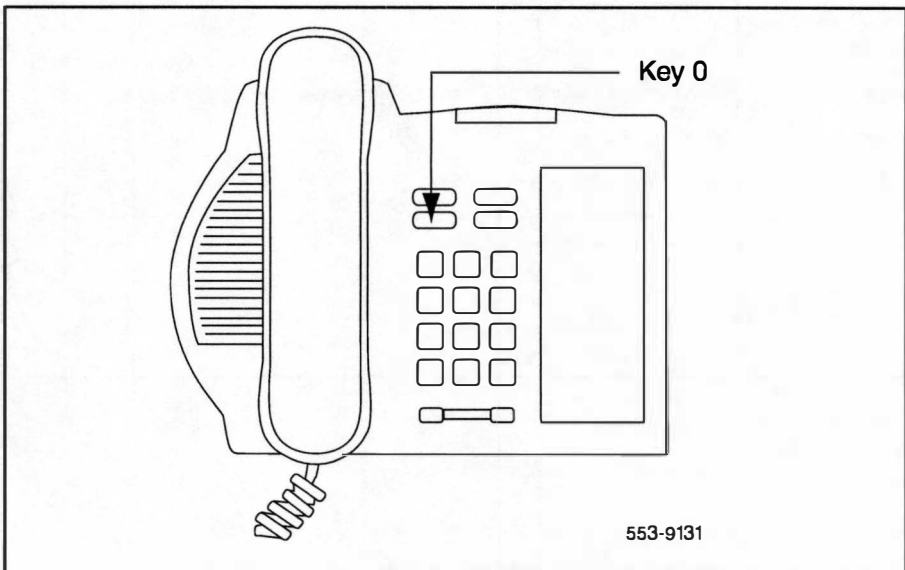
Table 8 gives a description of the keys on the M3901. Figure 7 shows the physical placement of the keys on the M3901.

Table 8
M3901 key description

Key Number	Description
Key 0	Line (Directory Number). Note: The system administrator can configure Key 0 as a Voice Call (VCC), HotLine (HOT) Key, Single Call Non-ringing, Private Line Non-ringing, Multiple Call Non-ringing, Private Line Ringing, or Multiple Call Ringing.
Key 1	Feature or Auto Dial.
Key 2	Feature or Auto Dial.
Key 3	Feature or Auto Dial.

Table 8
M3901 key description

Key Number	Description
Key 4	Feature or Auto Dial.
Key 5	Feature or Auto Dial. Note: The system administrator can configure Keys 1 - 5 with any feature that does not require a display (DAG, DWG, DSP and RMK). Note: recommends that all features be used as Auto Dial. Note: Nortel Networks recommends that the M3901 is not configured as an ACD DN.

Figure 7
M3901 key positions

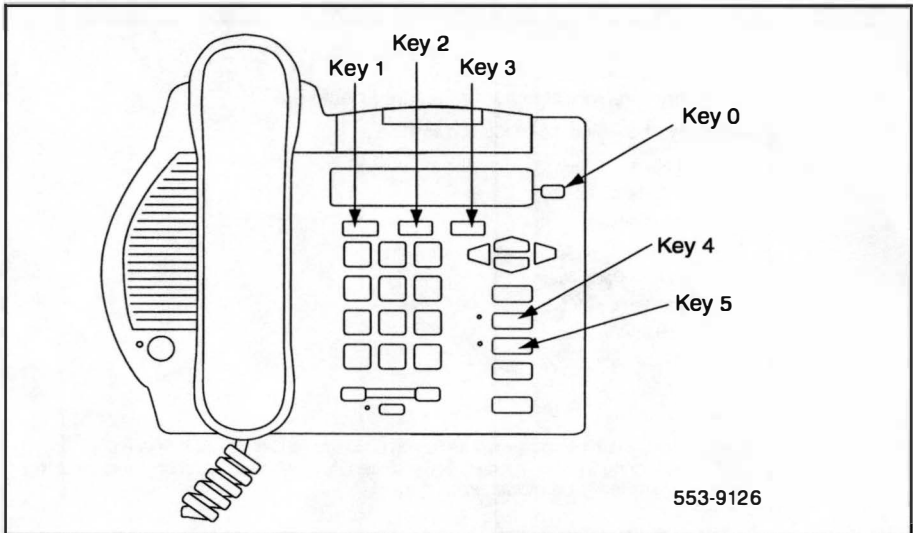
M3902 key descriptions

Table 9 gives a description of the keys on the M3902. Figure 8 shows the physical placement of the keys on the M3902.

Table 9
M3902 key description

Key	Description
Key 0	You must configure Key 0 as the Directory Number line. Note: You can configure Key 0 as a Voice Call (VCC), HotLine (HOT) Key, Single Call Non-ringing, Private Line Non-ringing, Multiple Call Non-ringing, Private Line Ringing, or Multiple Call Ringing.
Key 1	Feature or Auto Dial.
Key 2	Feature or Auto Dial.
Key 3	Feature or Auto Dial.
Key 4	Call Transfer (default) or 3 Party Conference or 6 Party Conference.
Key 5	Message Waiting. Note: Do not configure Keys 1-5 as: • Multiple Call Non-ringing • Multiple Call Ringing • Private Line Non-ringing • Private Line Ringing • Single Call Non-ringing • Single Call Ringing

Figure 8
M3902 key positions



M3903 key descriptions

Table 10 gives a description of the keys on the M3903. Figure 9 shows the physical placement of the keys on the M3903.

Table 10
M3903 key description (Part 1 of 3)

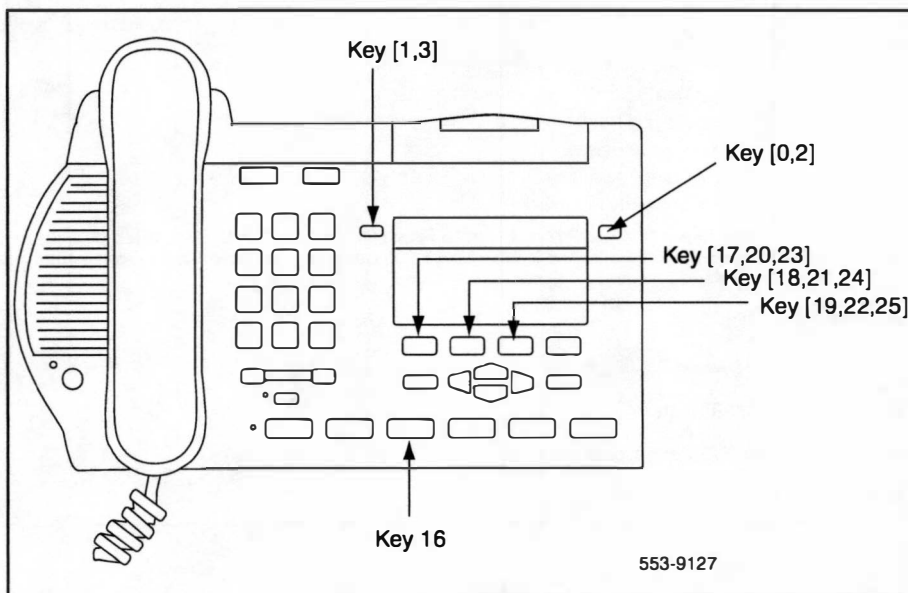
Key	Description
Key 0	Primary Directory Number.
Key 1	Secondary Directory Number or Feature or Auto Dial.
Key 2	Secondary Directory Number or Feature or Auto Dial.

Table 10
M3903 key description (Part 2 of 3)

Key	Description
Key 3	Secondary Directory Number or Feature or Auto Dial. Note: Keys 1-3 cannot be configured as: • 3 Party Conference • 6 Party Conference • Call Forward • Account Charge • Calling Party Number • Call Park • Privacy Release • Ring Again • RPN • Call Transfer Note: Keys 1-3 can be configured as Speed Call (Speed Call, System Speed Call, Speed Call Controller and System Speed Call Controller). Nortel Networks recommends that Key 23 be used for Speed Call features.
Key 4-15	Not used at this time.
Key 16	Message Waiting.
Key 17	Call Transfer.
Key 18	A03 (3 Party Conference) or the A06 (6 Party Conference).
Key 19	Call Forward.
Key 20	Ring Again.
Key 21	Call Park.
Key 22	Ring Number Pickup.
Key 23	Configure as: • Speed Call • System Speed Call • Speed Call Controller • System Speed Call Controller (manual configuration -needs speed call list #)

Table 10
M3903 key description (Part 3 of 3)

Key	Description
Key 24	Privacy Release.
Key 25	Charge Account.
Key 26	Calling Party number.
Key 27	Callers List
Key 28	Redial List
Keys 29-31	NUL.

Figure 9
M3903 key positions

M3904 key descriptions

Table 11 gives a description of the keys on the M3904. Figure 10 shows the physical placement of the keys on the M3904.

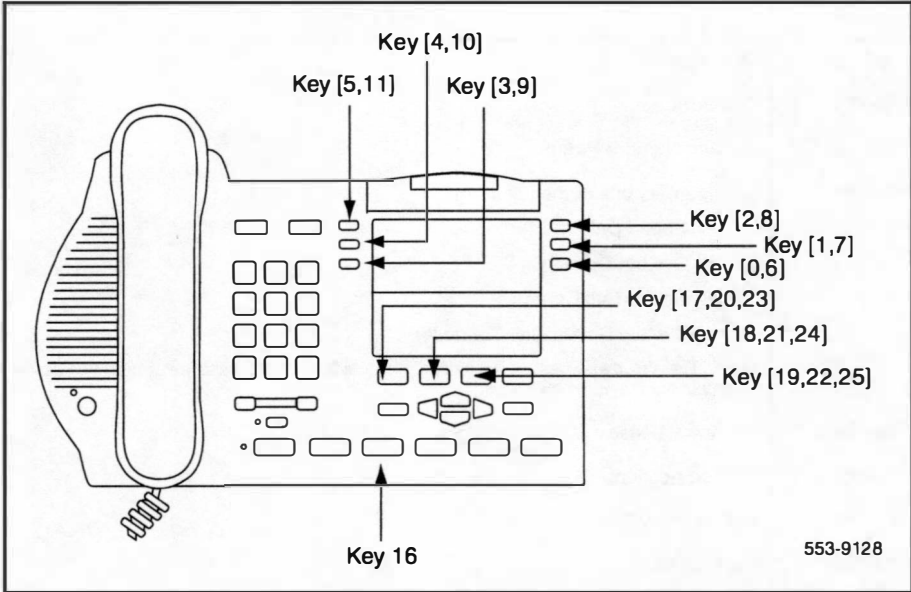
Table 11
M3904 key description (Part 1 of 2)

Key	Description
Key 0	Primary Directory Number.
Key 1-11	Secondary Directory Number or Feature or Auto Dial. Note: Keys 1-11 cannot be configured as: • Message Waiting • Transfer • 3 Party Conference • 6 Party Conference • Call Forward • Ring Again • Call Park • Ringing Number Pickup • Privacy Release • Charge Account • Call Party Number Note: Keys 1-11 can be configured as Speed Call (Speed Call, System Speed Call, Speed Call Controller and System Speed Call Controller). Nortel Networks recommends that Key 23 be used for Speed Call features.
Keys 12-15	Blocked.
Key 16	Message Waiting is not a default feature for this key.
Key 17	Call Transfer.
Key 18	A03 (3 Party Conference) or the A06 (6 Party Conference).
Key 19	Call Forward.

Table 11
M3904 key description (Part 2 of 2)

Key	Description
Key 20	Ring Again.
Key 21	Call Park.
Key 22	Ringing Number Pickup
Key 23	Configure as one of the following: • Speed Call • System Speed Call • Speed Call Controller • System Speed Call Controller Note: The above services are not a default feature for this key, these features can be used on any of the programmable keys.
Key 24	Privacy Release.
Key 25	Charge Account.
Key 26	Calling Party Number.
Key 27	Callers List
Key 28	Redial List
Keys 27-31	NUL.

Figure 10
M3904 key positions



For M3904 and M3905 sets, One-Button Feature Access keys for the Callers and Redial lists cannot be programmed on a Display Based Accessory (DBA) or a Key-Based Accessory (KBA).

M3905 key descriptions

Table 12 gives a description of the keys on the M3905. Figure 11 shows the physical placement of the keys on the M3905.

Table 12
M3905 key description (Part 1 of 3)

Key	Description
Key 0	Primary ACD Directory Number parallel to the *In-Calls Key. Note 1: The user can edit the label on Key 0 to display desired information. Note 2: The In-Calls fixed key and the Primary DN line key are linked together and both represent Key 0.
Key 1-4	Secondary Directory Number or Feature or Auto Dial. Note: Keys 1-4 cannot be configured as: • Message Waiting • Transfer • 3 Party Conference • 6 Party Conference • Call Forward • Ring Again • Call Park • Ringing Number Pickup • Privacy Release • Charge Account • Call Party Number Note: Keys 1-4 can be configured as Speed Call (Speed Call, System Speed Call, Speed Call Controller and System Speed Call Controller). Nortel Networks recommends that Key 23 be used for Speed Call features.
Key 5	Feature or future Application.
Key 6	Feature or future Application.
Key 7	Options.

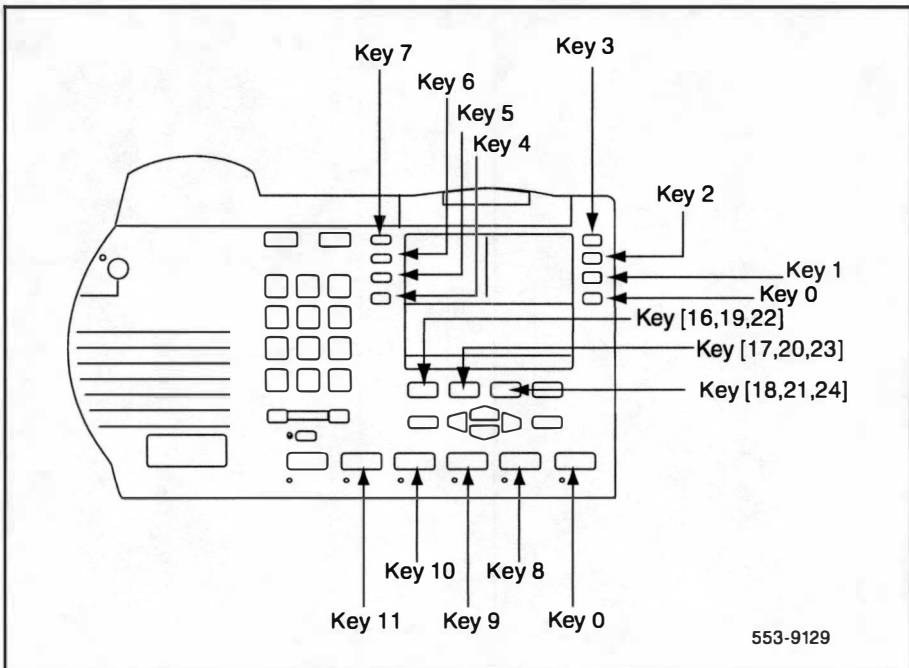
Table 12
M3905 key description (Part 2 of 3)

Key	Description
Key 8-11	Configured as one of the following standard Call Center features: Key 8 = * Make Set Busy Key 9 = * Not Ready (must have CLS = AGN). Key 10 = * Emergency (must have CLS = AGN). Key 11 = * Call Supervisor (must have CLS = AGN). The following features can be configured on any Key 8-11 with the change of the prelabeled key cap: Activity Code entry.Agent Answer. Answer Emergency Call. Display Queue = DWC (used with supervisor or agent telephones). Observe agent. Ring Agent (must have CLS = SPV). Note: Keys 8-11 are prelabeled in the factory; they are marked in this table with an Asterisk.
Key 16	Message Waiting key or another feature.
Key 17	Call Transfer key.
Key 18	A03 (3 Party Conference) or the A06 (6 Party Conference).
Key 19	Call Forward.
Key 20	Ring Again.
Key 21	Call Park.
Key 22	Ringing Number Pickup.
Key 23	Configured as one of the following speed call services: • Speed Call • System Speed Call • Speed Call Controller • System Speed Call Controller
Key 24	Privacy Release.

Table 12
M3905 key description (Part 3 of 3)

Key	Description
Key 25	Charge Account.
Key 26	Calling Party Number.
Key 27	Callers List
Key 28	Redial List
Keys 29-31	NUL.

Figure 11
M3905 key positions



Installation

Contents

The following are the topics in this section:

To install the M3900 Series Meridian Digital Telephones	88
Telephone positions	88
To wall mount the telephone	89
Accessory Connection Module (ACM)	89
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This section provides installation instructions for the M3900 Series telephone and accessories.

To install the M3900 Series Meridian Digital Telephones

- 1 Complete the wiring and cross-connections (loop power).
- 2 Connect the telephone to the connecting block.
- 3 Place the telephone upright on the desk in the normal operating position.
- 4 Supply the user with a quick reference guide.



CAUTION

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

Telephone positions

Your M3903, M3904 and M3905 Meridian Digital Telephones have several different height selections for the desktop positions.

To change the telephone position:

- 1 Press the tilt handle located at the top back side of the telephone.
- 2 With the tilt handle pressed in, raise or lower the telephone to the desired angle or height.
- 3 Release the tilt handle to lock the telephone in the desired position.

Note: The M3903 and M3904 can be wall mounted using the optional wall mount bracket.

The M3901 and M3902 Meridian Digital Telephones have three different angled height desktop positions.

To change the telephone angle:

- 1 Move the top of the footstand away from the telephone base (it has a snap connection).
- 2 Place the footstand in the desired position and snap the top of the footstand back into place.

To wall mount the telephone

The telephone wall mount bracket kit contains a one piece wall mount plate to attach the telephone to the wall.

To wall mount the telephone:

- 1 Place the wall mount bracket against the wall and mark the spot to insert the screws.
Note: M3901 and M3902 have built-in wall mount brackets.
- 2 Screw the five screws in and leave about 3 1/2 mm (1/8 inch) between the head of the screw and the wall.
- 3 Remove the footstand from the telephone by sliding the footstand down (using the plastic hinges) about 7 mm (1/4 inch).
- 4 Swing the footstand away from the telephone base and remove from the telephone.
- 5 Attach the wall mount bracket onto the back of the telephone by placing the telephone at the top edge of the wall mount bracket and sliding the telephone into place.
- 6 Mount the wall mount bracket, attached to the telephone onto the screws located on the wall.

Accessory Connection Module (ACM)

To install the ACM:

- 1 Disconnect the line cord from the telephone base before installing the ACM.
- 2 Slide the footstand down (using the plastic hinges) about 7 mm (1/4 in.) and swing the footstand away from the telephone base.
- 3 Snap the ACM into the rectangular opening on the back of the telephone.
- 4 Connect the ACM cable to the back of the telephone.

- 5 Put the ACM attached ribbon cable into the track running down the back of the telephone base.
- 6 Put the hard plastic cable cover over the ACM ribbon cable.
- 7 Snap the ACM plastic cable cover into place.
- 8 Place the footstand on the hinges.
- 9 Swing the footstand back into place.
- 10 Snap the footstand into a non-movable position.
- 11 Reconnect the line cord to the telephone base.
- 12 Return the telephone to an upright position.

There is a cutout on the base of the footstand which displays the ACM connector ports. When ready to attach an accessory, insert the appropriate cartridge into the port slot. There is one accessory port available on the M3902. There are two accessory ports available on the M3903, M3904 and M3905.

Note: A wall transformer is required to power any accessory cartridges. The transformer does not come with the ACM unit. Contact your Nortel Networks local distributor to order this ACM compatible wall transformer.

Note: The accessories you attach to the telephone must be compatible. The table "Accessory compatibility" on page 47 shows the compatibility of the available options.

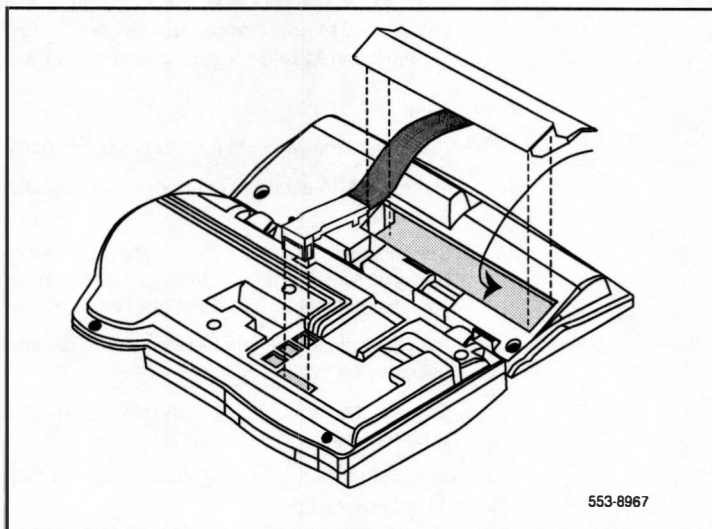
Figure 12 shows the installation of the ACM into the telephone footstand.

Accessory keying

On the M3903, M3904, and M3905, there are two accessory ports on the back of the telephone footstand. On the M3902, there is a single accessory port on the back of the footstand. Each port can support one cartridge accessory.

You cannot use two accessories that require the same port type at the same time. For example, you cannot use two accessories that require a serial port connection at the same time.

Figure 12
ACM module



The shape and size of the plug in the accessory cartridge prevents the user from accidentally connecting incompatible accessories. To check the compatibility of accessories, refer to Table 7 which shows the optional accessories and their compatibility.

Make sure you refer to the compatibility chart Table 7 "Accessory compatibility" on page 47 before you purchase your optional hardware accessories.

To install the Analog Terminal Adapter

The Analog Terminal Adapter (ATA) allows an off-the-shelf analog device (FAX, modem, or analog telephone (500/2500)) to work simultaneously with your M3902, M3903, M3904, or M3905 Meridian Digital Telephone. The ATA is not supported on the M3901 telephone.

Install the Accessory Connection Module (ACM) into your M3900 Series Meridian Digital Telephone (refer to the ACM Installation) before you install your ATA. The ACM provides connection capabilities between the M3902, M3903, M3904, and M3905 telephones and the ATA.

To install the ATA:

- 1 Disconnect the line cord from the telephone before installing the ATA.
- 2 Insert the ATA accessory cartridge into the ACM. The latch should be at the top.
- 3 Connect the commercial device you have selected to use, either your FAX machine, modem, or analog (500/2500) telephone, to the connection on your ATA cartridge interface.
- 4 Plug the transformer into the electrical outlet (use only the transformer designed for your ACM accessories).
- 5 Connect the Adapter plug, attached to your transformer, into the telephone wall jack.

The wall transformer Adapter plug attaches between the telephone line cord and the telephone wall jack.

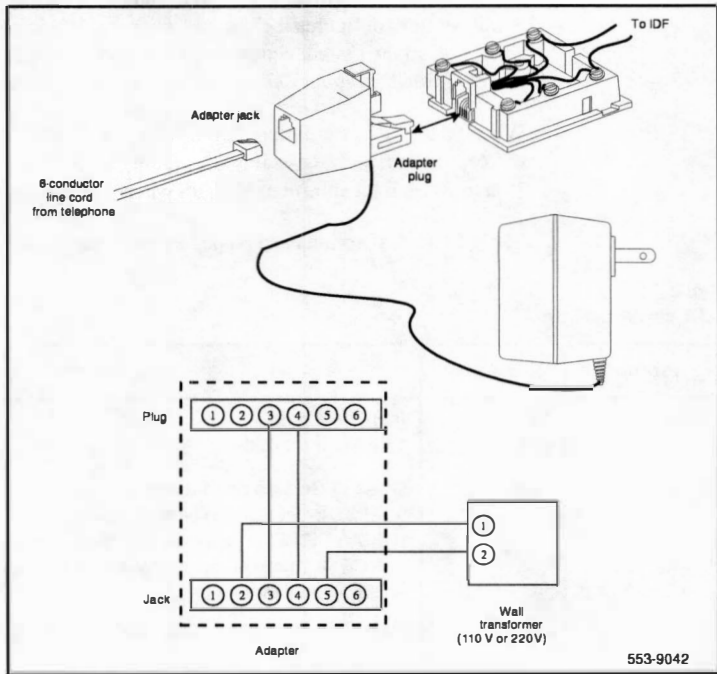
- 6 Connect the line cord to the Adapter jack attached to the wall transformer.
- 7 Reconnect the line cord back to your telephone base.

Figure 13 shows the connections for the wall transformer.

Note: Refer to the manufacturer's documentation for complete installation and configuration instructions for your external analog device (FAX machine, modem, or 500/2500 telephone).

Note: The ATA supports connections to POTS services only. ATA does not support Features such as Message Waiting, Switchhook Flash/Link, Transfer, Conference, and CLASS type services.

Figure 13
Wall transformer connection



A red LED status light located on the ATA indicates the status of the ATA.

- **Flashing red** indicates that the ATA is operating normally. For more troubleshooting guidelines, refer to the user documentation that came with your analog device.
- **Solid red** indicates that the ATA is not operating normally. Contact your system administrator.
- **Red light off** indicates that there is no power going to the ATA or the unit is not operating correctly. Check the power connections to the ATA. If problems continue, contact your system administrator.

Flexible voice and data capabilities allow you to have continuous use of both the Meridian Digital Telephone and the attached analog device. Your system administrator configures the flexible voice and data capabilities for your telephone on the system equipment. Contact your system administrator for more information about flexible voice and data capability.

When there is a power failure to the ATA, the Analog Device does not store or keep information (for example, outgoing FAX from your FAX machine). You must send the information again when power returns.

Table 13 shows prompts and responses when configuring the ATA.

Table 13
ATA configuration

Prompt	Response	Description
REQ	NEW CHG	Input new data Change current data.
CLS	aaaa	Class of Service options where aaaa: = (FLXD) - Flexible voice/data denied = FLXA - Flexible voice/data allowed, required if ATA equipped. = (VCE) - Voice terminal, required if ATA equipped. = DTA - Data terminal. Note: If ATA is installed, CLS must be FLXA, VCE.
KEY	0 SCR xxxx	Single Call Ringing, where xxxx = the DN for ATA

To install Personal Directory PC Utility software

The Personal Directory PC Utility provides a faster, easier way to create or modify a personal directory. You can enter names and numbers into a Personal Directory file on your Personal Computer (PC). You can download the PC file directly to the M3904 telephone. You can upload a directory from the M3904 to a PC to modify the M3904 directory.

To install the Personal Directory PC Utility Software:

- 1 Close all open applications before installing the Personal Directory PC Utility.
- 2 Insert the Personal Directory PC Utility disk into your floppy disk drive.

- 3 Click on Start.
- 4 Select Run.
- 5 Enter a:\setup (assuming that drive "a" is your floppy disk drive).
- 6 Click on OK. The Nortel Networks logo screen appears while the installation utility loads.
- 7 The Welcome screen appears. Click on Next to continue installation.
- 8 If you agree to the terms of the Software License Agreement, click on Yes.
- 9 Continue to Click on Next until the installation is complete.
- 10 When asked to, remove the disk from your floppy disk drive.
- 11 Click on Finish.
Note: You must restart your PC to access the Personal Directory PC Utility.
- 12 To select a port for the Personal Directory PC Utility; click on Phone. Click on Set port. The pull-down menu shows available PC ports:
 - Com1
 - Com2**Note:** The program selects the same port each time until you change it.

To install the Key-based Expansion Module Accessory

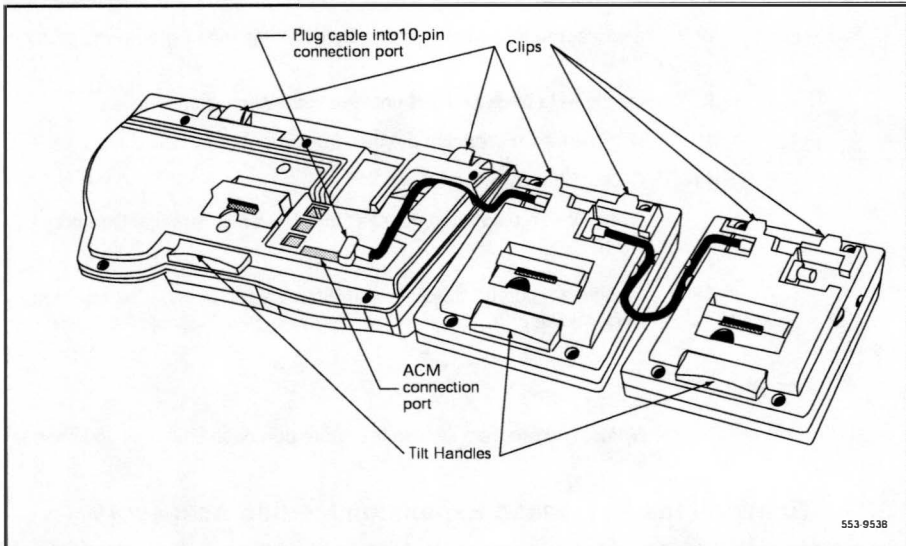
The Key-based Expansion Module Accessory (KBA) provides 22 additional line/feature keys for the M3904 and M3905 Meridian Digital Telephones. You can add up to two Key-based Expansion Modules providing a total of 75 line/feature keys.

To install the Key-based Expansion Module:

- 1 While depressing the telephone tilt handle, pull the telephone away from the footstand until it clears the final stop. Gently pull the footstand off the clips.
Note: If an ACM is installed, unplug the ACM and remove it from the the footstand. Install the ACM in the Single KBA Footstand Assembly.

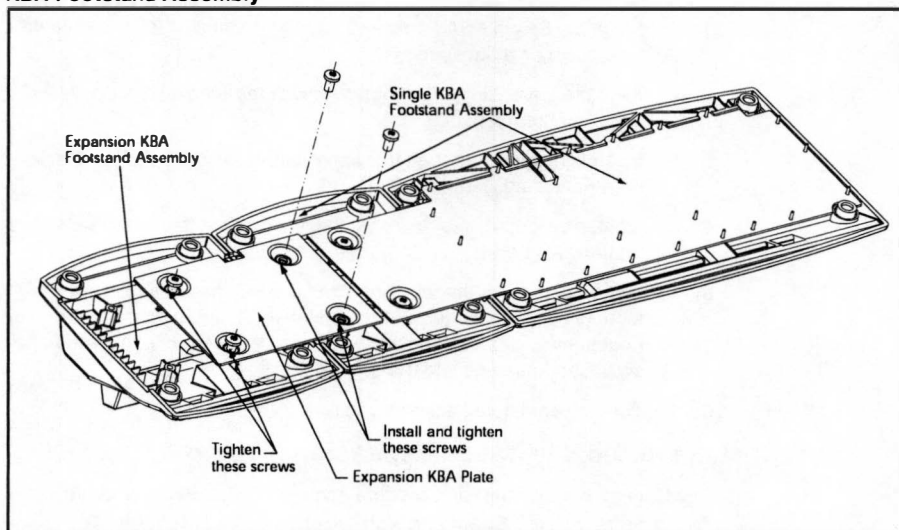
- 2 Place the telephone and the Module face down on a padded, level surface, and align them.
- 3 Plug the cable from the Module into the 10-pin connection port on the telephone. See Figure 14.

Figure 14
KBA Installation



- 4 Thread the cable through the opening in the side of the telephone.
- 5 Insert the clips on the telephone into the hinges on the footstand; then press on the front of the footstand until it snaps into place.
- 6 Install the Single KBA Footstand Assembly. See Figure 15.

Figure 15
KBA Footstand Assembly



7 To add a second Key-based Expansion Module:

- a) Place the telephone and the two modules face down on a non-abrasive surface.
- b) Plug the cable from the second module into the 10-pin connection port on the first module.
- c) Thread the cable through the routing clips on both modules.
- d) Install the Expansion KBA Footstand.

To install the Single KBA Footstand

- 1 Insert the clips on both the telephone and the Key-based Expansion Module into the hinges on the footstand assembly, and press on the front of the footstand until they snap into place.
- 2 While squeezing both the telephone and the Key-based Expansion Module tilt handles, swing the footstand into the desired position.
- 3 Turn the completed assembly upright.

To install the Expansion KBA Footstand

- 1** Place the Single KBA Footstand and the Expansion KBA Footstand face down on a flat surface.
- 2** Align the Expansion KBA Footstand with the Single KBA Footstand and slide them together.
- 3** Insert two screws through the Expansion KBA Plate into the Single KBA Footstand.
- 4** Tighten all four screws, ensuring that the two footstand assemblies are properly aligned.
- 5** Insert the clips on the telephone and the Key-based Expansion Modules into the hinges on the combined Single Expansion KBA Footstand Assembly, and while squeezing the Module Tilt Handles, swing the footstand into the desired position.
- 6** Turn the completed assembly upright.

To install the Display-based Expansion Module

The Display-based Expansion Module gives you three layers of eight Programmable Line/Feature (Self-labeled) Keys. The Display-based Expansion Module gives you a total of 24 Programmable Line/Feature Keys (Key 32 through 55).

The Page button allows you to scroll to each key layer. The Self-labeled field is 10 characters in length. You can customize the Display-based Expansion labels using the program mode and the dial pad keys.

To install the Display-based Expansion Module:

- 1** While depressing the telephone tilt handle, pull the telephone away from the footstand until it clears the final stop. Gently pull the footstand off the clips.
- 2** Place the telephone and the Display-based Expansion Module face down on a padded level surface, and align them.
- 3** Lower the Module into place, and insert the 10-pin plug on the Module into the 10-pin slot on the telephone. Push in gently until the retaining tabs snap into place.
- 4** Insert the clips on the telephone into the hinges on the footstand, then press on the front of the footstand until it snaps into place.

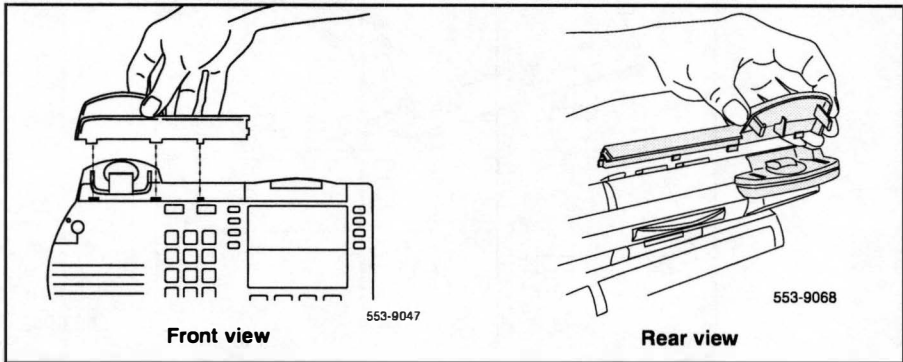
- 5 While depressing the telephone tilt handle, swing the footstand into the desired position, then release the handle.
- 6 Carefully turn the new assembly upright.

To install the handset option for the M3905 Call Center Telephone

The Handset Kit is a hardware option for the M3905 Call Center Telephone. The handset does not accompany the M3905 Call Center Telephone. The handset can be added to the M3905 by removing the front plate of the telephone.

Note: Nortel Networks recommends that a systems administrator complete this installation.

Figure 16
Removal of the Hook Switch Cover

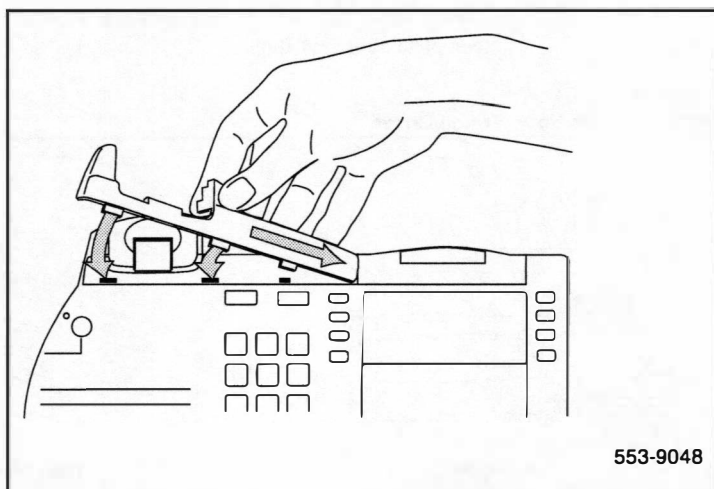


There are five tabs and two hidden snaps on the HookSwitch cover. There are two tabs along the right and three along the bottom edge (Front view). To remove the cover, the hidden snaps must be released (Rear view).

To remove the HookSwitch cover:

- 1 Ease the cover to the left and pull on the left side to release the left snap.
- 2 While holding the left snap out, ease the cover to the right and pull on the right side to release the right snap.
- 3 Carefully maneuver the cover out from the three bottom slots and rotate the cover to release the two side tabs.

Figure 17
Installation of the cradle



To install the cradle:

- 1 Hold the cradle in the same position as when you removed the Hook Switch Cover; move the cradle to the right to place the tab into the slot.
- 2 Ease the other tabs on the bottom edge of the cradle into the slots.
- 3 When all tabs are in the proper position, secure the cradle into place by pushing straight downward.

Headset options

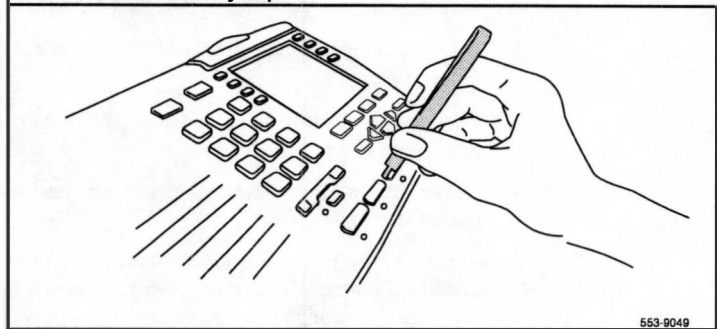
The M3901, M3902, M3904, and M3905 supports an amplified headset when the headset connects to the handset jack.

The M3903, M3904 and M3905 have a dedicated headset jack which supports a non-amplified headset. The M3903, M3904 and M3905 have a Headset Fixed Feature Key to turn the Headset on and off.

To install alternate key caps for the M3905

Use the Key Extractor Tool with the M3905 Call Center Telephone to remove the programmable keys and replace them with alternate keys customizing your telephone to fit your need.

Figure 18
Install the alternate key caps



As shown in Figure 18, place the tips of the tool into the slots at the right and left of the key, grip tightly and pull straight upward.

To install the key caps:

- 1 Fit the two small elastomer posts into two slots on the undersides of the keys and firmly press downward.
- 2 The key releases immediately after pressure is applied.

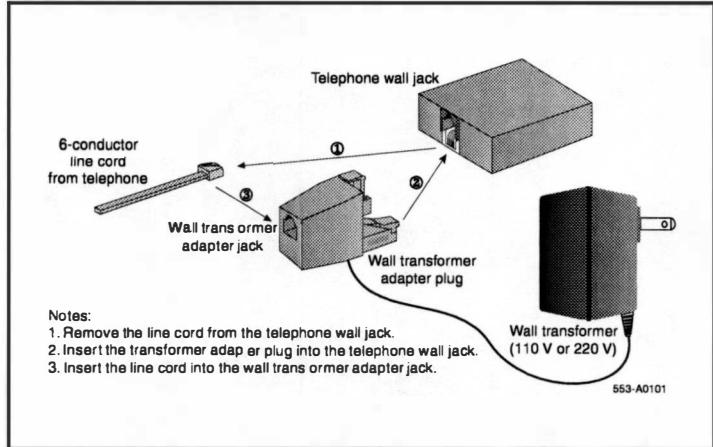
Note: If the key does not release, remove it. Attempt the installation again making sure that the posts and the slots are properly aligned.

To install the FDHF cartridge

To install the FDHF cartridge in an M3904 Phase III set, perform the following steps:

- 1 Check the label on the back of your set to make sure that it is an M3904 Phase III set (NTMN34GA). If your set is an NTMN34GA, go to Step 2.
If your set is not an NTMN34GA, it is not FDHF-compatible. Please contact your system administrator to obtain the correct set.
- 2 Install the Accessory Connection Module (ACM). For information on how to install the ACM, refer to "Accessory Connection Module (ACM)" on page 89.
- 3 Insert the FDHF cartridge into one of the ACM ports.
- 4 Plug the wall transformer into the electrical outlet.
- 5 Disconnect the telephone line cord from the telephone wall jack. See Figure 19 on page 103.
- 6 Connect the wall transformer adapter plug into the telephone wall jack. See Figure 19 on page 103.
- 7 Connect the telephone line cord to the wall transformer adapter jack. See Figure 19 on page 103.
- 8 Verify that the FDHF cartridge is working properly.
The FDHF cartridge is working properly when the red LED on the FDHF cartridge is flashing and when there are 18 segments on the volume bar.

Figure 19
Wall transformer connection



Environmental and safety considerations

Contents

The following are the topics in this section:

Reference list	105
Temperature and humidity	106
Safety and Electromagnetic Compatibility	107
Headset considerations	108
Line engineering	109
M3900 set power consumption	109

Reference list

The following are the references in this section:

- *Digital Telephone Line Engineering* (553-2201-180)

This section addresses special considerations for the M3900 Series Meridian Digital Telephone:

- temperature and humidity
- safety and electromagnetic compatibility
- headset considerations
- line engineering

Temperature and humidity

Operating state:	
Temperature range	0° to 50°C (32° to 104°F)
Relative humidity	5% to 95% (noncondensing). At temperatures above 34°C (93°F) relative humidity limited to 53 mbar of water vapor pressure.
Storage:	
Temperature range	–50° to 70°C (–58° to 158°F)
Relative humidity	5% to 95% (noncondensing). At temperatures above 34°C (93°F) relative humidity limited to 53 mbar of water vapor pressure.

Safety and Electromagnetic Compatibility

The M3900 Series Meridian Digital Telephones have been tested and found to comply with the following Safety and Electromagnetic Compatibility (EMC) Standards.

Safety	Description
EN 60950 / IEC 950	Safety of Information Technology Equipment including Electrical Business Equipment (Europe).
EN 41003	Particular Safety Requirements for Equipment to be connected to Telecommunications Network (Europe).
UL 1459	Safety Telecom (USA)
UL 1950	Safety Information Technology Equipment (USA)
CSA 22.2 225	Safety Telecom (Canada)
CSA 22.2 950	Safety Information Technology Equipment (Canada)
AS3260, TS001, TA-1302	Safety (Australia)
EMKO-TSE (74-SEC) 203/92	Nordic Deviations to EN 60950
BABT	Safety (UK)
JATE	Safety (Japan)

EMC - Radiated and Conducted	Description
EN55022 / CISPR 22 Class B	Radiated Emissions Basic Standard (Europe)
FCC Part 15 Class A	Radiated Emissions (USA)
CSA C108.8	Radiated Emissions (Canada)
VCCI	EMC (Japan)
AS/NZS 3548	EMC (Australia / New Zealand)

EMC - Immunity	Description
EN50082-1	Electromagnetic Compatibility - Generic immunity standard Part 1: Residential, commercial and light industry (Europe)
IEC 801-2 (level 4)	Electro Static Discharge (Europe)
IEC 801-3 (level 2)	Radiated Immunity (Europe)
IEC 801-4 (level 3)	Fast Transient/Burst Immunity (Europe)

Headset considerations

Test the headset with the telephone before using. In a noisy environment, an amplified headset is an option. When the amplified headset is used, there are two choices of volume control: the rocker control on the telephone and the switch on the headset. The user should adjust the telephone volume before adjusting the headset volume. To provide the best communication with the least amount of distortion, the amplifier should have a higher setting than the telephone volume control.

Refer to your distributor for the latest product bulletin from Nortel Networks recommending headset types for use with the M3900 Series Digital Telephone.

Line engineering

The M3900 Series Meridian Digital Telephones use twisted pair wiring on transmission lines determined by the rules in *Digital Telephone Line Engineering* (553-2201-180). The maximum acceptable loop length is 1067 m. (3500 ft), assuming 24 AWG (0.5 mm) standard twisted wire with no bridge taps. A 15.5 dB loss at 256 kHz defines the loop length limit. Longer lengths are possible, depending on the wire's gauge and insulation.

CAUTION

Use only the line cord provided with the telephone. A line cord designed for another telephone can cause damage to the equipment.

M3900 set power consumption

Table 14
M3900 set power consumption

	M3901	M3902	M3903	M3904	M3905
Idle	29.3	37.3	42.5	31.5	15.02
H/F Nominal	N/A	45.7	48.7	37.5	N/A
H/F Maximum	N/A	64.3	59.7	46.4	N/A
DBA Idle	N/A	N/A	N/A	39.29	15.31
DBA H/F Nominal	N/A	N/A	N/A	45.9	N/A
DBA H/F Maximum	N/A	N/A	N/A	52	N/A
Maximum 2 KBA Idle	N/A	N/A	N/A	33.42	14.98
Note: All measurements are in milli-amps.					

Appendix A: Flash Download procedure

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Feature overview

M3900 Flash Download provides the capability to download a new firmware version from the Meridian 1 to an M3900 telephone. Flash Download provides a way for installed M3900 telephones to be updated to the appropriate firmware release level for supporting features on the Meridian 1. Flash Download can be invoked for one M3900 telephone, for a group of M3900 telephones, or all telephones on the Meridian 1. It can be invoked locally or remotely for maintenance purposes. Features of the flash download procedure include the following:

- Set type can be specified (M3902, M3903, M3904, M3905, All)
- Day(s) of week can be specified
- Up to four intervals per day can be specified (start time, length)
- TN Range can be specified (start TN, end TN)
- DN Range can be specified (start DN, end DN)
- Force Download can be specified (yes, no)

Flash download is incorporated in the existing Peripheral Software Version (PSWV) background tasks of the Meridian 1 Work Schedule. Therefore, regular call processing is impacted as little as possible. In the context of this document, PSWV represents the firmware file that is downloaded to an M3900 set. It is sometimes referred to as a Peripheral Software Download (PSDL). Both PSWV and PSDL refers to an actual file that is downloaded to the M3900 set.

Flash Download requires the use of two software overlays in the Meridian system. Use LD 97 to configure the parameters for the Flash Download capability. Use LD 32 to run the feature. Before the Flash Download feature is used, configure the feature in LD 97.

Flash Download Procedure overview

See Tables 15 and 16 for the overall steps needed to perform a flash download. Table 15 is for small systems and Table 16 is for large systems. These tables list the versions of X11 software that an M3900 customer could be running and the high-level steps needed to upgrade to the latest Reissue software (25.08 Reissue or 25.15 Reissue). The tables reference "PSDL Installation Procedure" on page 142 for the steps to install the M3900 language set, PSWV. The tables also reference the "Detailed Flash Download procedure:" on page 123 for the step-by-step procedure for flash downloading firmware to the M3900 sets.

If you have difficulties in determining versions of X11 software, M3900 PSWV language files or firmware, refer to "Determining software, M3900 PSWV, or firmware versions" on page 121.

Table 15
Flash Download procedure matrix for small systems (Part 1 of 5)

Present software	Upgrade to software	Keycode required	M3900 telephones	Upgrade steps
24.24	25.08 (Re-issue)	Yes	Release 1	1. Call Nortel Networks technical support to find out how to receive an upgrade. • A SIM upgrade from 8 to 16 Meg is required. • An upgrade from MAT 6.5 is required. 2. Download software from the web. 3. Follow the "PSDL Installation Procedure" on page 142. 4. Install manufactured patches. 5. Download firmware to sets, following the Flash Download procedure.

Table 15
Flash Download procedure matrix for small systems (Part 2 of 5)

Present software	Upgrade to software	Keycode required	M3900 telephones	Upgrade steps
			Release 2	Note: This is not a standard process. M3900 Release 2 phones should not be configured on a Release 24.2x system. 1. Follow the small system Release 24.2x to Release 25.08 Reissue procedure for Release 1 telephones (above). The Release 25.08 Reissue contains M3900 Release 1 firmware. Follow the Flash Download process to downgrade the M3900 Release 2 phones to Release 1 firmware
	25.15 Re-issue	Yes	Release 1; Release 2	Follow the standard software order process.
25.08	25.08 Re-issue	No	Release 1	1. Download software from the web. 2. Follow "PSDL Installation Procedure" on page 142. 3. Install manufactured patches 4. Download firmware to sets, following the Flash Download procedure.

Table 15

Flash Download procedure matrix for small systems (Part 3 of 5)

Present software	Upgrade to software	Keycode required	M3900 telephones	Upgrade steps
			Release 2	Note: This is not a standard process. M3900 Release 2 telephones should not be configured on a Release 25.08 system). 1. Follow small system 25.08 to 25.08 Reissue procedure for Release 1 telephones (above). The 25.08 Reissue contains M3900 Release 1 firmware. Following the flash download process downgrades the M3900 Release 2 telephones to Release 1 firmware.
	25.15 Re-issue	Yes	Release1; Release 2	Follow the standard software order process.

Table 15
Flash Download procedure matrix for small systems (Part 4 of 5)

Present software	Upgrade to software	Keycode required	M3900 telephones	Upgrade steps
	25.10 Re-issue	Yes	Release 1; Release 2	1. Call Nortel Networks technical support to find out how to receive an upgrade. - On Option 51C CP2 systems, a DRAM upgrade from 16 to 32 Meg is required. - An upgrade from MAT 6.5 is required. 2. Determine M3900 PSWV to install (see Table 18 on page 136). Note: Select PSWV #5 (Release 1 firmware for X11 Release 24; second PCMCIA card is needed) only if the customer is just running the Release 24 M3900 features. 3. Download software from the web with the appropriate PSWV language file. 4. Follow the PSDL Installation Procedure (see "PSDL Installation Procedure" on page 142) to install software with the selected M3900 PSWV file. 5. Install the manufactured patch. 6. Download firmware to the telephones, following the Flash Download procedure.

Table 15
Flash Download procedure matrix for small systems (Part 5 of 5)

Present software	Upgrade to software	Keycode required	M3900 telephones	Upgrade steps
25.15	25.15 Reissue	NO	Release 1; Release 2	1. Determine M3900 PSWV to install (see Table 18 on page 136). Select PSWV #1 Global or #4 N.A. (25% savings; second PCMCIA card needed). <i>Note:</i> Select PSWV #5 (Release 1 firmware for X11 Release 24; second PCMCIA card needed) only if the customer is just running the Release 24 M3900 features. 2. Download software from the web with appropriate PSWV language file. 3. Follow the PSDL Installation Procedure, see "PSDL Installation Procedure" on page 142 to install software with the selected M3900 PSWV file. 4. Install manufactured patches. 5. Download firmware to sets, following the Flash Download procedure.

Table 16

Flash Download procedure matrix for large systems (Part 1 of 3)

Present software	Upgrade to software	Keycode required	M3900 telephones	Upgrade steps
24.25	25.08 Re-issue	Yes	Release 1	1. Call Nortel Networks technical support to find out how to receive an upgrade. - On Option 51C CP2 systems, a DRAM upgrade from 16 to 32 Meg is required. - An upgrade from MAT 6.5 is required. 2. Follow the PSDL Installation Procedure (see "PSDL Installation Procedure" on page 142). 4. Install the manufactured patches. 5. Download the firmware to the telephones, following the Flash Download procedure.
			Release 2	Note: This is not a standard process. There should not be M3900 Release 2 telephones on a Release 24.2x system. 1. Follow large system 24.2x to 25.08 Re-issue procedure for Release 1 telephones (above). The 25.08 Re-issue contains M3900 Release 1 firmware. Following the flash download process downgrades the M3900 Release 2 telephones to Release 1 firmware.
	25.15 Re-issue	Yes	Release 1; Release 2	Follow the standard Software order process.

Table 16

Flash Download procedure matrix for large systems (Part 2 of 3)

25.08	25.08 Re-issue	No	Release 1	1. Call Nortel Networks technical support to find out how to receive an upgrade. 2. Follow the PSDL Installation Procedure (see "PSDL Installation Procedure" on page 142). 4. Install the manufactured patches. 5. Download the firmware to telephones, following the Flash Download procedure.
			Rel. 2	Note: This is not a standard process. There should not be M3900 Release 2 phones configured on a 25.08 system). 1. Follow the large system 25.08 to 25.08 Re-issue procedure for Release 1 telephones (above). The 25.08 Re-issue contains M3900 Release 1 firmware;. Following the Flash Download process downgrades the M3900 Release 2 phones to Release 1 firmware.
	25.15 Re-issue	Yes	Release 1; Release 2	1. Follow the standard Software order process.
25.10	25.15 Re-issue	Yes	Release 1; Release 2	1. Call Nortel Networks technical support to find out how to receive an upgrade. 2. Determine the M3900 PSWV to install (see Table 18 on page 136). Select PSWV #1 Global or #4 N.A. (25% savings). Note: Select PSWV #5 (Release 1 firmware for X11 Release 24) only if customer is just running the Release 24 M3900 features 3. Follow PSDL Installation Procedure (see Appendix A) to install software with selected M3900 PSWV file 4. Install manufactured patches 5. Download firmware to sets following flash download procedure

Table 16
Flash Download procedure matrix for large systems (Part 3 of 3)

25.15	25.15 Reissue	NO	Rel. 1, Rel. 2	1. Determine M3900 PSWV to install (see Table 18 on page 136). Select PSWV #1 Global or #4 N.A. (25% savings). Note: Select PSWV #5 (Release 1 firmware for X11 Release 24) only if the customer is just running the Release 24 M3900 features. 2. Follow the PSDL Installation Procedure (see Appendix A) to install software with selected M3900 PSWV file. 3. Install the manufactured patches 4. Download the firmware to sets following the Flash Download procedure.
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Determining software, M3900 PSWV, or firmware versions

X11 software versions

Use the ISS command in LD 22 to identify X11 software versions. When trying to determine whether a system's software has been upgraded to the Reissue of 25.08 or 25.15, patches MPLR13167 and MPLR13247 must be loaded and the LD 22 ISS command must be issued. If "PSWV Version 32" appears for X11 Release 25.08 software, the 25.08 Reissue software has been loaded. If "PSWV Version 33" appears for X11 Release 25.15 software, the 25.15 Reissue software has been loaded.

M3900 language PSWV versions

To find the M3900 Language PSWV version on small systems, follow steps 2-6 in the "Installation procedure for Option 11C and Option 11 Mini" on page 156". At step 6, select item 1 "List 3900 series language sets". The system then prints the M3900 Language PSWV file version and name, which is referenced in Table 18 on page 136.

To find the M3900 Language PSWV version on large systems, follow the appropriate large system procedure in this appendix. When you get to the PSDL Installation menu under the Install M3900 set Language menu, select item 2 "List 3900 set languages". The system then displays the PSDL file that is currently installed on the machine, as well as other PSWV files available to install.

An alternative procedure for both large and small systems is to download an M3900 set on the system and query the language version for that set through the set's display diagnostics. See "M3900 firmware versions" on page 122 for information on obtaining the firmware version through display diagnostics. Once the firmware version has been obtained, it can be cross referenced to the M3900 PSWV language version in Table 18 on page 136.

M3900 firmware versions

Use the FWVU command in LD 32 to obtain the firmware version of an M3900 set. The firmware version or language version can be found through the display diagnostics on the M3900 set. You can obtain the display diagnostics through the following procedure:

- 1 Press the "Options" key on the M3900 set
- 2 Scroll to the Display Diagnostics entry, using the up or down navigation keys
- 3 Press the "Select" softkey
- 4 Scroll to the screen that shows the language file and firmware version using the up or down navigation keys.

For the latest firmware versions contained in the X11 software Reissue, refer to Table 18 on page 136. For information on firmware versions which fix particular M3900 problems, refer to Matrix G in the latest version of the M3900 Digital Telephone Advisory Bulletin.

The general rules for identifying which versions of firmware are Release 1 and which are Release 2 for the M3903, M3904 and M3905 sets are as follows:

- Release 1 firmware vintages are less than version 4.0 (<40 from LD 32 FWVU response).
- Release 2 firmware vintages are greater or equal to version 4.0 (>= 40 from LD 32 FWVU response).

Detailed Flash Download procedure:

- 1 Identify sets to be downloaded. If possible, organize by Set type, TN Range, or DN Range.
 - a. To determine set quantity and type, use LDs 97 and 32 to print the ranges of sets using the commands given below.
- 2 Establish set quantity.
- 3 Estimate the time required for download. Downloading sets with the North America reduced language set file takes nine minutes per set (on the M3905 it takes 12 minutes). Language sets other than the North America reduced language set file take 12 minutes to download. On small systems (Option 11C), you can download four sets in parallel. On large systems, you can download one set per XPEC in parallel, up to a maximum of 8 on CP4 and 31 on CPP.

The following formulas provide estimates of download times:

- Small systems—North American 6 Language file:

$$((\text{Quantity of M3902, 3, 4} \times 9 \text{ minutes}) + (\text{quantity of M3905} \times 12 \text{ minutes})) / 4$$
 where 4 details the number of sets that can be downloaded in parallel.
- Small system—Global 10 Language file:

$$(\text{Quantity of M3902, 3, 4, 5} \times 12 \text{ minutes}) / 4$$
 where 4 details the number of sets that can be downloaded in parallel
- Large System—North America 6 Language file:

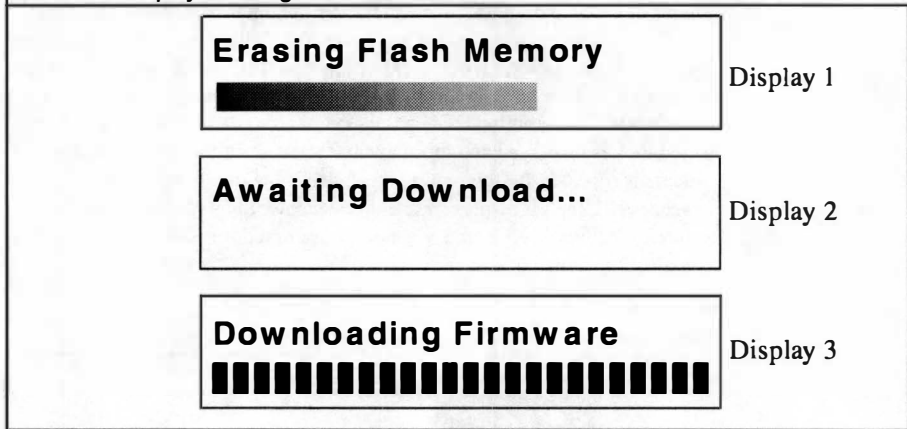
$$((\text{Quantity of M3902, 3, 4} \times 9 \text{ minutes}) + (\text{quantity of M3905} \times 12 \text{ minutes})) / \text{number of XPEC's (assuming even distribution of sets)}$$
- Large System—Global 10 Language file:

$$((\text{Quantity of M3902, 3, 4, 5} \times 12 \text{ minutes})) / \text{number of XPEC's (assuming even distribution of sets)}$$

- 4 Based on the quantity of sets and the site situation, determine how the download will occur:
 - a. Individual downloads (Use individual commands in LD 32)
 - b. System download (Use system download command in LD 32)
 - c. Scheduled download/range download (Use scheduled download commands in LD 32 and LD 97)
- 5 Issue the appropriate download command.
- 6 As the download occurs, the set displays the following information:

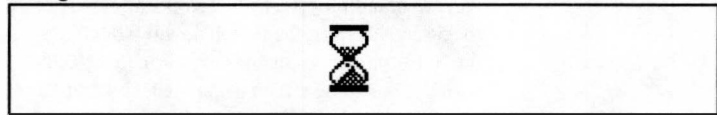
During a flash download, the M3902, M3903, and M3905 telephones display messages on the displays at the right. (See Figure 20 on page 125) Display 1 shows the "Erasing Flash Memory" message along with blocks written to the second line (each with decreasing contrast). This is followed by Display 2 that reads "Awaiting Download." Display 3 flashes the text "Downloading Firmware" on the first line with progress bars on the second line. When all 24 segments of the progress bars are displayed as shown, the download is complete. The telephone then resets and returns to service. All user-controlled parameters, such as screen contrast, volume settings, and key labels are not affected by the firmware download. In the event that the firmware download was not successful, the text "Terminal Out of Service is displayed on the first line. In some cases, the set erases the flash memory, showing Display 1 followed by Display 2.

Figure 20
Information displayed during a flash download



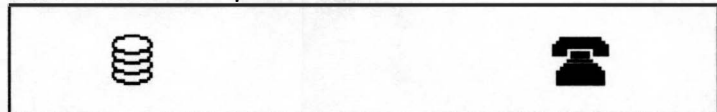
For the M3904, an hourglass icon is displayed during the flash memory erase process (see Figure 21). The erase process can take up to 15 seconds.

Figure 21
Hourglass icon



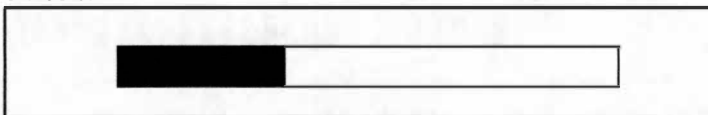
After a successful memory erase, an icon showing a stack of disks (left side of the display) and a phone icon (right side of the display) are displayed (see Figure 22). These icons remain on the display during the entire download.

Figure 22
Stack of disks and telephone icons



Upon receiving the first flash data packet, a page status bar is displayed (see Figure 23). Depending on the language files being downloaded, there are three or four memory pages that are downloaded (three for North American, four for Global, Eastern/Western European versions). As additional flash data packets are received, the status bar advances to the right until the current page is completely programmed. Once the next page starts to download, a new page block is displayed and the status bar starts from the left again. This process is repeated for the remaining pages. If the download was unsuccessful, the set displays a telephone icon with an X through it. This indicates that the flash memory is not programmed (or is corrupt) and a new download must be done again.

Figure 23
Status bar



Upon completion of the flash download (all 3/4 pages have been received), the set verifies the flash memory contents before displaying the IDLE screen. The IDLE screen consists of the Date (Jan. 1 12:00am) and the brandline (Nortel Networks or customer programmed logo). Up to 25 seconds later, the switch downloads all the parameters to the set and the IDLE screen is updated according to the switch settings (for example, softkeys are shown, date is updated, and soft label keys are shown).

- 7 As the download occurs, various messages can appear on the system terminal. A complete list of these messages is in *System Messages* (553-3001-411). The most important message is the following:

SDL2110 e hw a v m: Failed to download software to device, where:

e (cause of the error) can be:

- 1 = Acknowledgment timeout error
- 2 = Peripheral Software (PSW) version or checksum error
- 3 = PSW record checksum error
- 4 = PSW record format error
- 5 = Card firmware state error

hw (card name) can be:

XNET (Network Card) XPEC (Peripheral Controller)

a (card address) can be:

Loop for Network Card Network/DTR Card
XPEC # (loop shelf) for Peripheral Controller

v is the PSW version

m can be:

FAST MODE (from initialization)
MAINT MODE (by ENLL command in LD 30)
BKGD MODE (second attempt after initialization from background program)

Hw (3902 3903 3904 3905) for M3900 flash download

e (cause of the error for M3900) can be:

- 1 = Timeout error
- 2 = PSW checksum error
- 3 = Record checksum error
- 4 = Record format error
- 5 = Firmware state error
- 6 = Invalid page number received
- 7 = Unrequired page delivered during download
- 18 = Flash memory cannot be erased (M3900)
- 19 = Error detected while programming flash (M3900)
- 20 = An application is currently active, download cannot proceed (M3900)
- 21 = verification byte incorrect (M3900)

Action: Try to download to the card using the appropriate enable command.

Procedure notes:

- For Symposium Call Center Server (SCCS) sites, you do not have to de-acquire sets from the SCCS (pulled out of all queues); however, the statistics might not be valid.
- To downgrade an M3900 telephone from Release 2 firmware to Release 1 firm ware, or to change the language file from North American to another language file (or vice versa) use PSWV File #5 from Table 18 on page 136.
- For the downgrade procedure and language changes, refer to “Install software on Core/Net 1” on page 145 and “Install software on Core/Net 0” on page 148 for Options 61C/81/81C.
- For the downgrade procedure and language changes, refer to “Install PSDL File” on page 154 for Option 51C.
- For the downgrade procedure and language changes, refer to “Installation procedure for Option 11C and Option 11 Mini” on page 156 for the Option 11C and Option 11 Mini.

Overlay 97

The following tables show the configuration parameters that must be configured before using the Flash Download feature.

LD 97 – Configure the system-wide Flash Download parameters.

Prompt	Response	Description
REQ	CHG PRT	Change Flash Download parameters. Print Flash Download parameters.
TYPE	FDL	Flash Download for M3900 sets.
FDTP	t <CR>	Enter M3900 set type selected for Flash Download 3902 = M3902 3903 = M3903 3904 = M3904 3905 = M3905 ALL = All of the above NONE = None of the above (default)
FDTM	(NO) YES	Time interval restriction for Flash Download Do not change time intervals (default). Proceed to change time intervals. Note 1: Flash Download is automatically paused one hour before virtual midnight (see TODR in LD 17) to allow midnight routines to run. Note 2: This option is not applicable to reporting.
FDAY	dn	Enter the day and number of time intervals for the Flash Download. The FDAY prompt appears only if FDTM = YES. Day is reprompted until you enter a <CR> d = Day of the week (0-6 for Sunday to Saturday) n = Number of time intervals (0-4) To disallow download for the day, enter 0. Note: If two or more intervals are specified, they must be non-overlapping, non-consecutive, and increasing in order.
FINT	sl	Enter starting hour and length for a time interval. Prompted n times if n>0. s = starting hour (0-23) l = length of interval in hours (1-24)
FTNR	(NO) YES	TN range restriction option for Flash Download. NO TN restriction (default) Specify TN range.

FSTN	l s c u c u	Starting terminal number for Flash Download. Prompt appears only if FTNR = YES.
FETN	l s c u c u	Ending terminal number for Flash Download. Prompt appears only if FTNR = YES.
FDNR	(NO) YES	DN range restriction option for Flash Download. No DN restriction (default). Specify DN range.
FDDN	c d1 d2 <CR>	Flash Download Prime Directory Number range. Prompt appears only if FDNR = YES. c = Customer number (0-99) d1 = starting Prime DN d2 = ending Prime DN
FRCE	(NO) YES	System-wide Flash Download control option Conditional (default). System-wide Flash Download (through FDLS in LD 32) applies only to an M3900 series set whose flash firmware version is different from the version currently found on the system disk. Forced System-wide Flash Download to all specified M3900 series sets regardless of their current flash firmware versions. Note 1: Use this option with caution! Once the download tree is built (i.e., after executing FDLS in LD 32), this option automatically reverts to NO. Note 2: This option is not applicable to reporting.
FVER	v	Flash firmware version specified for full report. v = Flash firmware version (0-99) If 0, report all versions (default). Note: This option is applicable to reporting only (through FSUM ALL in LD 32).

Overlay 32

To use the Flash Download capability, load Overlay 32 and issue the following commands:

Single-Set Flash Download

Flash DownLoad Unit (FDLU) - initiate flash download for this unit. For this command to work, the set must be in an idle state. That is, there can be no active call, no active application, and the set must be configured and in working condition (responding to a query command). Also, the firmware version on the set must not be current. That is, it must be different from the one on the system disk.

. FDLU l s c u

l = loop address

s = shelf address

c = card address

u = unit address

Flash DownLoad Idle (FDLI) - initiate flash download as soon as the set is idle. For this command to work, the set must be in working condition. If the set is idle, the downloading occurs immediately. If the set is on an active call, downloading occurs immediately after the call is terminated. However, if after the active call is terminated, there is an active application on the set, downloading is aborted. Again, the downloading operation occurs only if the version on the set is not current.

. FDLI l s c u

Flash DownLoad Forced (FDLF) - initiate flash download immediately. For this command to work, the set must be in working condition. If the set is idle, the downloading occurs immediately. If the set is on an active call, the call is force disconnected and then downloading occurs immediately after the disconnect. It also force downloads the system disk version even if the set firmware version is more current. However, if there is an application active on the set, the downloading operation is aborted.

. FDLF l s c u

System-wide Flash Download

To prepare and trigger the flash download for the whole system manually, load Overlay 32 and issue the following commands:

Flash Download System (FDLS) - initiate system-wide flash download based on the parameters specified in LD 97. This initiates the system-wide flash download to all, or the specified type of M3900 sets, from the system disk if the flash firmware version on the set is different from the version found on the disk.

During system-wide flash download, when flash download detects that an M3900 set is in an active call connection, the set is skipped. Download logic keeps track of skipped sets, and comes back to attempt the download later.

M3900 flash download attempts download to each set up to three times. If download does not succeed by the third attempt (whether due to an active call connection or some problem such as a transmission error), flash download to the set is considered to have failed. An appropriate message is displayed for each set that fails the firmware upgrade process. Upon completion of system-wide flash download, a completion message is displayed on the maintenance set. This operation can take up to several days to complete depending on the traffic load, the total number and distribution of the equipped M3900 sets, and the scheduling of the download. See Table 17 on page 133 for estimations on download times.

When M3900 sets fail system-wide flash download, you can then determine the cause of the failure, perform corrective action, and repeat the flash download command – system-wide or for a specific set.

.FDLS

Flash Download Cancel (FDLC) - cancel the system-wide flash download. From Overlay 32 or outside of the overlays, you can cancel or stop the system-wide flash download operation gracefully by issuing the FDLC command. A download in progress to the current set(s) completes before the download process terminates.

.FDLC

Table 17 shows the estimated Flash Download times.

Table 17
Estimated Flash Download times

System	Average Lines	M3900 Lines	Download Time 10 languages	Faster Download 6 languages
11C	100	80 (100%)	4 hours	3 hours
51C/61C	400	200 (~60%)	20hrs. (2 XPECs) 10hrs. (4 XPECs)	15 hours 7.5 hours
81/81C	1350	650 (~60%)	22 hrs. (6 XPECs)	16.5
MSL-100	8000	4800 (~60%)	30 hrs. (32 XPECs) 20 hrs. (48 XPECs)	22.5 hours 15 hours

The following assumptions apply to Table 17:

- 20% trunking on all systems
- 100% M3900 sets on Option 11C systems
- 60% M3900 sets on large systems
- The Faster Download is based on using the North American language files for the M3902, M3903, and M3904 (PSWV File #4 is shown in Table 18 on page 136), which are 25% smaller than the Global language files. Therefore, they take 25% less time to download. The languages that are missing from the North American reduced language file are: Swedish, Italian, Norwegian, and Finnish. The languages contained in the North America reduced language file are: English, French, German, Spanish, Brazilian Portuguese, and Japanese Katakana.

Print Firmware Versions on M3900 Sets

To determine the firmware version information on M3900 sets, use the following commands in Overlay 32:

Firmware Version on Unit (FWVU) - Print current firmware versions on the unit. You can query and print the firmware versions (downloadable flash firmware, as well as core firmware) currently on the specified set using this command. See Table 18 on page 136 for a list of current firmware versions.

.FWVU l s c u

Firmware version SUMmary (FSUM) - Print the firmware version summary report for all the M3900 sets. This command prints the M3900 firmware versions found on the system disk and lists every version together with a count of M3900 sets that are found to have this version.

.FSUM

The format of the report is as follows:

```
**M390x SUMMARY REPORT**  
dd - ON DISK  
ff(cc) - nnnn SETS FOUND  
ff(cc) - nnnn SETS FOUND
```

Where:

x = 2 to 5 for M3902 to M3905
dd = the flash firmware version found on the system disk
ff = the downloadable flash firmware version found on the sets
cc = the core firmware found on the sets
nnnn = the number of sets found with firmware version ff (cc)

Firmware version SUMmary ALL (FSUM ALL) - Displays a complete report on all M3900 Series telephones based on the parameters in LD 97.

.FSUM ALL

The format of the report is as follows:

```
TYPE: ttt   CUST: cc   PDN: ddddddd TN: l s c u   FW: vv
```

Where:

tttt = 3902, 3903, 3904, 3905

cc = 0-99

dddddd = the Primary DN of the telephone

vv = the flash firmware version

Query Disk Firmware Versions

To determine the firmware version residing on the system disk(s) available for download to the M3900 sets, use the PSWV command in Overlay 22 to print the firmware versions for M3900 sets. See Table 18 on page 136 for a list of current firmware versions.

. PSWV

Table 18
Firmware and PSWV versions

PEC codes	PSWV codes					F/W codes	
	2	3	4	5		6	7
M3900 SET (## = 66, 70) XX = See Note 1	PSWV File	PSWV Region	M1 F/W file (PSWV) See Note 2	LD 22 Response for PSWV See Note 3		Set F/W Diagnostic See Note 4	LD 32 FWVU Response for set F/W See Note 5
M3902							
NTMN32 XX-##	PSWV File #1	Global (10 lang.)	3902.loadaa 40	M3902: S/W VERSION NUMBERS: 40		Lang: L1.9 F/W Ver: 4.0	FLASH FIRMWARE VERSION = 040
	PSWV File #4	N. America (6 lang.)	3902.loadda 40	M3902: S/W VERSION NUMBERS: 40		Lang: L4.9 F/W Ver: 4.0	FLASH FIRMWARE VERSION = 040
M3903							
NTMN33 XX-##	PSWV File #1	Global R2: (10 lang.)	3903.loadaa 51	M3903: S/W VERSION NUMBERS: 51		Lang: L1.9 F/W Ver 5.1	FLASH FIRMWARE VERSION = 051
	PSWV File #4	N. America R2 (6 lang.)	3903.loadda 51	M3903: S/W VERSION NUMBERS: 51		Lang: L4.9 F/W Ver 5.1	FLASH FIRMWARE VERSION = 051

NTMN33 XX-##	PSWV File #5	Rel. 1 for X11 Rel 24	3903.loadaa 36	M3903: S/W VERSION NUMBERS: 36	Lang: P1.9 F/W Ver 3.6	FLASH FIRMWARE VERSION = 036
M3904						
NTMN34 XX-##	PSWV File #1	Global R2: (10 lang.)	3904.loadaa 46	M3904: S/W VERSION NUMBERS: 46	Flash: 4.6 P0 L1.8	FLASH FIRMWARE VERSION = 046
	PSWV File #4	N. America R2 (6 lang.)	3904.loadaa 46	M3904: S/W VERSION NUMBERS: 46	Flash: 4.6 P0 L4.8	FLASH FIRMWARE VERSION = 046
NTMN34 XX-##	PSWV File #5	Rel. 1 for X11 Rel 24	3904.loadaa 34	M3904: S/W VERSION NUMBERS: 34	Flash: 3.4 P0 L1.8	FLASH FIRMWARE VERSION = 034
M3905						
NTMN35 XX-##	PSWV File #1	Global (10 lang.)	3905.loadaa 32	M3905: S/W VERSION NUMBERS: 32	Lang: L1.9 F/W Ver 3.2	FLASH FIRMWARE VERSION = 032
	PSWV File #4	N. America (10 lang.)	3905.loadaa 32	M3905: S/W VERSION NUMBERS: 32	Lang: L1.9 F/W Ver 3.2	FLASH FIRMWARE VERSION = 032

The following notes apply to Table 18:

Note 1: For Column 1 labeled *M3900 Set*, XX is a two-letter alpha character that is part of the product code. For instance, a product code of NTMN32AB is a later issue than a code of NTMN32AA. Release 1 M3900 sets all started with a "BA" designation for U.S. and Canada sets, and "AA" for Canada only icon sets. Release 2 M3900 sets all started

with a “FA” designation for U.S. and Canada sets and “EA” for Canada only icon sets.

Note 2: For Column 4 labeled *M1 F/W File*, the two-letter alpha character followed by two numbers (format: 390x.loadxx##) shows the release level of the PSWV file. For instance, M3902.loadaa40 is a later issue than M3902.loadaa36. The most up-to-date file names are shown.

Note 3: For Column 5 labeled *LD 22 Response for PSWV*, the two number code is the firmware version release level. The larger the number, the newer the version. The last two digits correspond to the same version number as the M3900 firmware version. For instance, M3903: S/W VERSION NUMBERS: 51 is equivalent to M3900 F/W Version 5.1. The most current versions are shown.

Note 4: Column 6, labeled *Set F/W Diagnostic*, shows the language file in use and the firmware level of the set, as seen on an M3900 display. The larger the number, the newer the version. The latest versions are shown. To view the firmware level of an M3900 set, press the Options key, scroll to the Display Diagnostics entry, and press Select. Use the Down Navigation key to get to the screen that shows the language file and firmware version.

Note 5: For Column 7 labeled *LD 32 FWVU Response for set F/W*, the three-digit number shows the firmware version of the set. The larger the number, the newer the version. For example, a number of 040, refers to a firmware version of 4.0. The latest versions are shown.

Flash Download advisements

- Since the Flash Downloading feature of the M3900 takes some bandwidth from the system signaling path while it is operating, it is recommended that downloading be scheduled in off-peak hours for best results. There is some real time impact to the system since the system processor is busy doing the downloads. However, there is no impact to call processing, since call processing has a higher priority. Therefore, downloads take longer during peak traffic times because the system processor is busy doing call processing and cannot devote as much time to the M3900 downloads. There is no difference between large and small systems for this.

- When a system is first brought into service with M3900 sets, there is a significant amount of messaging that occurs to activate the sets through the Lamp Audit background routine. The time required to bring all sets into service on a system is dependent on the system configuration, and could take several hours. Performing a Flash Download directly after the system is brought into service adds to the message load on the system. Therefore, it is recommended that M3900 set download activities not occur in conjunction with systems being brought into service. Instead downloads should occur 24 hours after a system is brought into service.
- If a user attempts to use a set during a flash download, all set activity is ignored.
- When performing a flash download to an M3900 port that does not have a set installed, or downloading to an M3900 port that has the wrong M3900 set type installed, an SDL2110 error message is printed out at the system.
- During the middle of flash download operation, if the set is disconnected or if the set fails download for any reason, the set is rendered inoperable. Flash downloading must run to completion before the set can be made operable.
- For the manual individual download operation, if the set is not responding (is not operational) or if the set is not a M3900 set, flash download fails.
- If the firmware file(s) used as the source for flash download to M3900 sets are not present (in the proper location) on the Meridian 1 system disks, the flash download operation fails.
- While a system-wide flash download operation is in progress, attempts to disable sets that are currently being downloaded result in an SCH 1958 message that is printed with the list of sets involved. If a loop, shelf, or card that contains the sets being downloaded is disabled, then the download to the sets on that loop, shelf, or card fails.
- According to the existing PSWV logic, when PSWV is in progress, an attempt to load an overlay is denied and result in an OVL0306 message.

- Nortel Networks strongly recommends that you not force load an overlay (load with a Suspend option) unless there is an emergency while PSWV is in progress. In this instance, existing PSWV logic aborts downloading for the current PSWV block (of cards or sets of a given type being downloaded) and restarts the download for that block and remaining ones after the overlay is exited. If this happens to M3900 flash download, the block of sets are out-of-service for a lengthy period of time and this prolongs the completion of the system-wide flash download.
- If system warm-start (Initialization) or cold-start (Sysload) occurs while flash download is in progress, the download process is aborted abruptly. Any sets which are in the middle of download fail to complete firmware download and are left inoperable. You must re-enter the single-set or system-wide flash download command later to restart and complete the download. For system-wide downloads, any previously scheduled sets are no longer queued for download.
- While a manual individual download operation is still in progress, do not abort Overlay 32 (except in an emergency) by using the **** command. If the overlay is aborted before completing the download, the set is left inoperable until a flash download command for the set is re-entered and completed at a later time.
- During system wide download, you can use all overlays by issuing the `ld x susp` command. However, this ungracefully stops the download to the current group of sets that are being downloaded and leaves them without firmware until the overlay is exited. The download to these sets is then started again.
- While a system-wide flash download operation is in progress:
 - Service change (CHG, MOV, or OUT) to a unit that is currently being downloaded is blocked in Overlay 11. An SCH1958 message is printed.
 - Move (MOV) or remove (OUT through LD 11 or Automatic Set Relocation) to an M3900 set before its flash download starts prevents download to the set in this cycle of system-wide flash download.
 - A new M3900 set added (through LD 11 or Automatic Set Relocation) after the FDLS command is issued is not included in this round of system-side download.

- When scheduling the Flash Download of sets, note that one hour before the Midnight routines execute, the flash download process is gracefully stopped. The Flash downloading resumes once midnight routines are executed.
- When a schedule is defined in LD 97 and the Flash Download is started (by entering the FDLS command in LD 32), all scheduled sets are queued for download. The download process remains active in the background until the download is complete or is canceled (using the FDLC command in LD 32). If the download is active in the background (sets not actively downloading per the scheduled download time) and the download schedule is removed in LD 97, the download begins immediately for the sets that remain in the download queue. Use the LD x SUSP command to load an overlay when the download is active in the background (scheduled but not actively downloading sets). It is also not possible to perform a single set download (FDLU, FDLI, or FDLF command from LD 32) while the download is active in the background. If an individual download is attempted in this case, the system indicates that the PSDL is not idle. If an individual set download is necessary while the download is active in the background, you must cancel the download in LD 32 using the FDLC command. Once the individual downloads are complete, you can restart the schedule download with the FLDS command in LD 32.

Note: If the force option is used with the FDLS command, all sets in the original schedule are downloaded.

- For M3900 sets actively being flash downloaded when the Flash Download Cancel FDLC command is issued, the flash download to these sets is completed before the flash download process cancels.
- M3905 sets acquired by the Symposium Call Center Server (SCCS) do not have to be de-acquired (pulled out of all queues) before the flash download is started. However, during the download, the agent using the M3905 set is placed in a maintenance-busy state for approximately 12 minutes. As a result, the SCCS is not able to record any agent statistics for agents using the M3905 sets during the download. The SCCS agent reports for the interval in which the download occurred will, therefore, be inaccurate.

PSDL Installation Procedure

During a flash download, the system downloads the contents of a PSDL/PSWV file to an M3900 set. This PSDL Installation Procedure can be used to load a new PSDL/PSWV file on the system in place of totally reinstalling system software. If there are concerns about system downtime in regards to performing software upgrades in cases where only a new PSDL/PSWV file is needed, this process allows the replacement of the PSDL/PSWV file only.

Installation procedures for Options 61C, 81, and 81C

Note: This procedure does not include instructions on general software installation nor does it cover installing new IODU/C cards. To use this procedure, you must already be equipped with IODU/C cards that have the X11 software installed.

Use the parallel reload procedures to convert from one X11 release of PSDL files to a later release, or to change the PSDL file within the same X11 release. Parallel reloads can be done from either CPU. For the purposes of this document, we begin with CPU 0.

Table 19 summarizes the required steps to perform this procedure.

Table 19
Options 61C,81,81C parallel reload summary

Step	Action
1	Perform a data dump.
2	STAT the hardware.
3	Split the Cores.
4	Install PSDL file on Core/Net 1.
5	Switch call processing from Core/Net 0 to Core/Net 1.
6	Test Core/Net 1.
7	Install software on Core/Net 0.
8	Exit Split mode.
9	Test Core/Net 0 and 1.
10	Synchronize the hard disks.
11	Perform a data dump.

Perform a data dump

- 1 Load the Equipment Data Dump Program (LD 43). At the prompt, enter: **LD 43** to load the program
- 2 When EDD000 appears on the terminal, enter: **EDD** to begin the data dump.
- 3 When "DATABASE BACKUP COMPLETE" or "DATADUMP COMPLETE" appears on the terminal, enter: ******** to exit the program.



CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

STAT the hardware

- 1 Load LD 137 and get the status of the hard disks.

Note: Be sure the hard disks are synchronized. If not, synchronize before proceeding.

LD 137

STAT Get the status of the hard disks

SYNC Synchronize hard disks if necessary. Synchronization may take up to 50 minutes

TEST CMDU Performs hard and floppy disk test.

**** exit program

- 2 Load LD 135 and get status of the CPs, CNIs and memories.

LD 135

STAT CPU Get the status of both CPs and memory

STAT CNI Get the status of all configured CNIs

- 3 Test the standby (inactive) CP. Then switch CPs, and test again.

TEST CPU Test standby (inactive) CP

Wait until the terminal returns a complete test message. The message HWI533 or HWI534 does not mean the test has completed!

SCPU Switch CPs

TEST CPU Test the standby (inactive) CP

Note: Testing the CPs can take up to 20 minutes for each test. When the test is complete, the memories are automatically synchronized.

Split the Cores

- 1 Be sure CP 0 is active and CPI is standby. You may need to switch CPs again:

STAT CPU

**** exit program

- 2 Verify that IODU/C 0 is active. You may need to switch IODU/Cs.

LD 137

STAT Get the status of IODU/C

SWAP Switch IODU/Cs if necessary

******** exit program

- 3 Connect a terminal to the CPSI port in Core/Net 1 to J25 of the I/O panel at the back of the Core/Net. Be sure it is configured as follows. The recommended baud rate is 9600, to be the same as the CPSI port.

7 data bits, 1 stop bit, Space parity, Full duplex, XON protocol

- 4 Place CP 0 in Maintenance by setting the MAINT/NORM switch to MAINT.
- 5 In Core/Net 1, disable the CNI cards by setting the ENB/DIS faceplate switches to DIS

Install software on Core/Net 1

- 1 Place the CP Install disk that corresponds with the installed CP card type into the IODU/C in Core/Net 1.
- 2 Install the CD-ROM into the CD drive:
 - a. Press the button on the CD-ROM drive to open the CD-ROM disk holder.
 - b. Place the CD-ROM disk into the holder with the disk label showing.
 - c. Use the four tabs to secure the CD-ROM drive.
 - d. Press the button again to close the CD-ROM disk holder (do not push the holder in by hand).
- 3 In Core/Net 1, perform the following three steps in uninterrupted sequence:
 - a. Press and hold the MAN RST button on the CP card.
 - b. Set the MAINT/NORM switch on the CP card to MAINT.
 - c. Release the MAN RST button.

A sysload begins (cold start). Wait for the Main Menu to appear on the terminal before proceeding.

Note 1: If the CD-ROM is not in the CD drive of the IODU/C, the installation procedure will not continue. Insert the CD-ROM into the drive to continue.

Note 2: If a problem is detected during the system verification, Install stops, prints an error message, and aborts the installation. If the verification is not successful, do not continue. Contact your technical support organization.

- 4 Press <CR> to continue.
- 5 Log in to the system and enter the time and date, when prompted.
- 6 Initiate the installation by selecting the following command from the menu:

 <u> to Install menu
- 7 Remove the CP Install Program diskette and insert the Keycode diskette, when prompted.

 <a> to continue with keycode validation

 <y> to confirm that the keycode matches the CD-ROM release
- 8 When the Install Menu is displayed, select the following option:

 <p> To install 3900 set Languages
- 9 The PSDL Installation Menu appears. Select:

 2. List 3900 set languages

 This displays the PSDL file that is currently installed on the machine and the PSDL files are available to install.

 Press <cr> until the main menu appears.
- 10 When the Install Menu is displayed, select the following option:

 <p> To install 3900 set Languages
- 11 The PSDL Installation Menu appears. Select:

 1. Install 3900 set languages

- 12 The list of PSDL files that can be downloaded appears. Select the PSDL file you desire.

The install program backs up your current PSDL file and installs the new file. When it is complete, you are returned to the Main Install menu.

- 13 From the main menu, choose the following:

<q> to quit (remove any diskettes from the floppy drive)

<y> Yes, to confirm quit

<a> to reboot the system

Note: The system automatically performs a sysload, during which several messages appear on the system terminal. Wait for the DONE and then INI messages to be displayed before continuing.

Switch call processing to Core/Net 1



CAUTION

Call processing will be interrupted!

Perform these next steps carefully. This is the point at which your service is interrupted. Calls in process will be interrupted, especially if Peripheral Software Download takes place. Some calls may be dropped.

Perform the next four steps in succession. Call processing will be switched from Core/Net 0 to Core/Net 1.

- 1 In Core/Net 0, set the DIS/ENB faceplate switch on the IODU/C card to DIS.
- 2 In Core/Net 0, disable the CNI cards by setting the ENB/DIS faceplate switches to DIS.
- 3 In Core/Net 1, enable the CNI cards by setting the ENB/DIS faceplate to ENB.
- 4 In Core/Net 1, press the MAN INT button.

Note: Call processing is now switched from Core/Net 0 to Core/Net 1.

Test Core/Net 1

- 1 Test Call Processing. This includes, but is not limited to the following:
 - a. Check for dial tone.
 - b. Make internal, external, and network calls.
 - c. Check attendant console activity.
 - d. Check DID trunks.
 - e. Check any auxiliary processors.

Note: From this point forward you will be upgrading Core/Net 0.

Install software on Core/Net 0

- 1 Move the CPSI port cable from J25 on Core/Net 1 to J25 on Core/Net 0.
- 2 Set the IODU/C faceplate switch to ENB.
- 3 Place the CP Install disk that corresponds with the installed CP card type into the IODU/C in Core/Net 0.
 - a. Press the button on the CD-ROM drive to open the CD-ROM disk holder.
 - b. Place the CD-ROM disk into the holder with the disk label showing.
 - c. Use the four tabs to secure the CD-ROM drive.
 - d. Press the button again to close the CD-ROM disk holder (do not push the holder in by hand).
- 4 Press the MAN RST button on the CP card in Core/Net 0 to reboot the system and start the Software Installation Tool. (The terminal displays SYSLOAD messages during file loading. When SYSLOAD is completed, the NT logo appears.)
- 5 When the NT logo appears, press <CR> to continue.
- 6 When the Main Menu appears, select the following options in sequence:
 <u> to Install menu

- 7** Remove the CP Install Program diskette and insert the Keycode diskette. Select the following when prompted:

<a> to continue with keycode validation
<y> to confirm that the keycode matches the CD-ROM release
<q> to quit (remove any diskettes from the floppy drive)
<y> Yes, to confirm quit
<a> to reboot the system

The system automatically performs a sysload, during which several messages appear on the system terminal. Wait for DONE and then the INI messages to be displayed before continuing.

- 8** When the Install Menu is displayed, select the following option:

<p> To install 3900 set Languages.

- 9** The PSDL Installation Menu appears. Select:

2. List 3900 set languages

This displays the PSDL file that is currently installed on the machine and the PSDL files that are available to install.

Press <cr> until the main menu appears.

- 10** When the Install Menu is displayed, select the following option:

<p> To install 3900 set Languages

- 11** The PSDL Installation Menu appears. Select:

1. Install 3900 set languages

The list of PSDL files that can be downloaded appears. Select the PSDL file you desire.

The install program backs up your current PSDL file and installs the new file. When it is complete, you are returned to the Main Install menu

- 12** From the main menu choose the following:

<q> to quit (remove any diskettes from the floppy drive)
<y> Yes, to confirm quit
<a> to reboot the system

The system automatically performs a sysload, during which several messages appear on the system terminal. Wait for DONE and then the INI messages to be displayed before continuing.

Exiting split mode

- 1 Connect the CPSI port or maintenance SDI port.
- 2 Enable the CNI cards by setting the ENB/DIS faceplate switch to ENB in Core/Net 0.
- 3 Perform the following in uninterrupted sequence:
 - a. Press and release the MAN RST button in Core/Net 0.
 - b. When SYS700 messages appears on LCD display on Core/Net 0, set the MAINT/NORM switch to NORM in Core/Net 0.

In 60 seconds, the LCD displays and confirms your processes with:
RUNNING ROM OS
ENTERING CP VOTE

An HWI534 message indicates the start of memory synchronization. In 10 minutes, an HWI533 message on Core/Net 1 CSPI or SDI terminal indicates the memory synchronization is complete.

- 4 In Core/Net 1, set the MAINT/NORM switch on the CP card to NORM.

Test Core/Net 1 and Core/Net 0

- 1 Perform a redundancy sanity test using the following sequence:

LD 135

STAT CNI Get status of CNI cards

STAT CPU Get status of CPU and memory

TEST CPU Test the inactive Core/Net

TEST CNI c s Test each inactive CNI card

2 Switch Cores and test the other side (Core/Net 0)

SCPU Switch cores

TEST CPU Test the inactive Core/Net

TEST CNI c s Test each inactive CNI card

Note: Testing the CP and CNI cards and synchronizing memory can take up to 20 minutes for each test. When the CP test is complete, the CP and the memory is automatically synchronized.

3 Clear the display and minor alarms on both Cores.

CDSP Clear the displays on the Cores

CMAJ Clear major alarms

CMIN ALL Clear minor alarms

4 Get the status of the Cores, CNIs, and memory.

STAT CPU Get the status of both Cores

STAT CNI Get the status of all configured CNIs and memory

Note: You may need to execute the STAT CNI command twice before receiving a response from the system.

**** exit program

Synchronize the hard disks

- 1 Load LD 137 and synchronize the hard disks. Synchronization can take up to 50 minutes. To be sure that the contents of IODU/C 1 are copied to IODU/C 0, verify that IODU/C 0 is disabled.

LD 137

STAT Get the status of the IODU/C and redundancy

SYNC Enter "Yes" to synchronize disks. Wait until the memory synchronization successfully completes before continuing. TEST CMDU Performs hard and floppy disk test.

- 2 Get the status of the CMDU's and be sure CMDU 0 is active. Switch if necessary.

STAT Get the status of IODU/C and redundancy

SWAP Switch CMDU if necessary

STAT CMDU Get the status of the IODU/Cs. Be sure the same IODU/C and CPU are active.

**** exit program

Perform a data dump

- 1 Load the Equipment Data Dump Program (LD 43). At the prompt, enter:
LD 43 to load the program
- 2 When EDD000 appears on the terminal, enter:
EDD to begin the data dump
- 3 When DATABASE BACKUP COMPLETE or DATADUMP COMPLETE appears on the terminal, enter:
**** to exit the program



CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

The PSDL file has now been installed on your switch.

Install procedure for Option 51C

Use this procedure to convert from one X11 release of PSDL files to a later release, or to change the PSDL file within the same X11 release for Option 51C systems only.

Table 20 summarizes the required steps to perform this procedure.

Table 20^T
Option 51C installation procedures

Step	Action
1	Perform a data dump.
2	STAT the hardware.
3	Install PSDL file.
4	Test the system.
5	Perform a data dump.

Perform a data dump

- 1 Load the Equipment Data Dump Program (LD 43). At the prompt, enter: **LD 43** to load the program.
- 2 When EDD000 appears on the terminal, enter: **EDD** to begin the data dump.
- 3 When "DATABASE BACKUP COMPLETE" or "DATADUMP COMPLETE" appears on the terminal, enter: ******** to exit the program.



CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

STAT the hardware

- 1 Load LD 137 and get the status of the hard disks.
 LD 137
 STAT Get the status of the hard disks
- 2 Load LD 135 and get the status of the CP, CNI, and memory.
 LD 135
 STAT CPU Get the status of the CPU and memory
 STAT CNI Get the status of the CNI.

Install PSDL File

- 1 Select the CP Install diskette which matches the Call Processor (CP) type on your system.
- 2 Insert the CP Install diskette into the floppy drive of the IODU/C.
- 3 Press MAN RST on the CP card. The system is booted from the floppy and the Install tool is automatically invoked.
- 4 Press <CR> to continue.
- 5 Log in to the system and enter the time and date, when prompted.
- 6 Initiate the database installation by selecting the following command from the menu:
- 7 Remove the CP Install Program diskette and insert the Keycode diskette, when prompted.

 <u> to Install menu
 <a> to continue with keycode validation
 <y> to confirm that the keycode matches the CD-ROM release
- 8 When the Install Menu is displayed, select the following options in sequence when you are prompted to do so:

 <p> To install 3900 set Languages

- 9** The PSDL Installation Menu appears. Select:

2. List 3900 set languages

This displays the PSDL file that is currently installed on the machine and the PSDL files that are available to install.

Press <cr> until the main menu appears

- 10** When the Install Menu is displayed, select the following option:

<p> To install 3900 set Languages

- 11** The PSDL Installation Menu appears. Select:

1. Install 3900 set languages

- 12** The list of PSDL files that can be downloaded appears. Select the PSDL file you desire.

The install program backs up your current PSDL file and installs the new file. When it is complete, you are returned to the Main Install menu

- 13** From the Main Install menu, select the following options:

<q> to quit (remove any diskettes from the floppy drive)

<y> Yes, to confirm quit

<a> to reboot the system

The system automatically performs a sysload, during which several messages appear on the system terminal. Wait for DONE and then INI messages to be displayed before continuing.

Test Call Processing

- 1** Test Call Processing. This includes, but is not limited to the following:

- a. Check for dial tone.
- b. Make internal, external, and network calls.
- c. Check attendant console activity.
- d. Check DID trunks.
- e. Check any auxiliary processors.

Complete the upgrade

- 1 Perform a redundancy sanity test using the following sequence:

LD 135

STAT CNI Get status of CNI card

STAT CPU Get status of CPU and memory

- 2 Clear the display and minor alarms.

CDSP Clear the displays on the Cores

CMAJ Clear major alarms

CMIN ALL Clear minor alarms **** exit program

The PSDL conversion is complete.

Installation procedure for Option 11C and Option 11 Mini

- 1 Download the software executable file for the software release being installed (M3900 language file – version xx) from the web site to your Software Delivery card.
- 2 Install the Software Delivery card in slot A of the PCMCIA socket in the faceplate of the SSC or MSC card.
- 3 Use Overlay 143 to start the Software Installation Program.
- 4 Select Utilities from the Main Menu.

The main menu displays:

Software Installation Main Menu:

1. New Install or Option 11/11E Upgrade - From Software DaughterBoard

2. System Upgrade

3. Utilities

4. New System Installation - From Software Delivery Card
[q]uit, [h]elp or [?], <cr> - redisplay

Enter Selection: 3

- 5 Select item 9 - Change 3900 series set languages from the Utilities menu

The Utilities menu displays:

Utilities Menu:

1. Restore Backed Up database
 2. Archive Customer defined databases
 3. Install Archived database
 4. Review Upgrade Information
 5. Clear Upgrade Information
 6. Undo Installation
 7. Flash Boot ROM Utilities
 8. Current Installation Summary
 9. Change 3900 series set languages.
- [q]uit, <cr>current menu, [m]ain, [p]revious menu

- 6 Select item 2 - Change current 3900 series language set.

The system displays:

The Change 3900 series language set menu displays:

Change 3900 series set language menu:

1. List 3900 series language sets.
 2. Change current 3900 series language set.
 3. Restore 3900 series language set.
- [q]uit, [r]estore, [m]ain menu, [h] help or [?], <cr> - redisplay

7 Specify drive name for 3900 series language set files in PCMCIA

Enter selection: A

WARNING: Following selection will overwrite the existing psdl.rec file

WARNING: Need to perform sysload after psdl file is changed.

1 Global version 10 Languages - English, French, German, Spanish, Swedish, Italian, Norwegian, Brazilian Portuguese, Finnish, Japanese Katakana

2 Western Europe 10 Languages - English, French, German, Spanish, Swedish, Norwegian, Danish, Finnish, Italian, Brazilian Portuguese

3 Eastern Europe 10 Languages - English, French, German, Dutch, Polish, Czech, Hungarian, Russian, Latvian, Turkish

4 North America 6 Languages - English, French, German, Spanish, Brazilian Portuguese, Japanese Katakana

5 Spare Group A

6 Spare Group B

[q]uit, [h]elp or [?],<cr> - redisplay

8 Enter selection: __ (of your choice)

Backing up the current psdl.rec file... [wait] 3630080 bytes copied.

Copying current psdl.rec file... [wait] 3630080 bytes copied.

3900 series language set file successfully installed. 67 bytes copied.

9 Perform a sysload to enable new 3900 series set language.

Install Procedures for 81C Pentium II Call Processor

Use the parallel reload procedures to convert from one X11 release of PSDL files to a later release or to change the PSDL file within the same X11 release. Parallel reloads can be done from either CPU. For the purposes of this document, we begin with CPU 0.

Table 21 summarizes the required steps to perform this procedure.

Table 21
Option 81C CP PII parallel reload summary

Step	Action
1	Perform a data dump.
2	STAT the hardware.
3	Split the Cores.
4	Install the PSDL file on Core/Net 1.
5	Switch call processing from Core/Net 0 to Core/Net 1.
6	Test Core/Net 1.
7	Test Core/Net 1.
8	Install PSDL file on Core/Net 1.
9	Exiting split mode
10	Test Core/Net 1 and Core Net 0.
11	Perform a data dump.

Perform a data dump

- 1 Load the Equipment Data Dump Program (LD 43). At the prompt, enter: **LD 43** to load the program
- 2 When EDD000 appears on the terminal, enter: **EDD** to begin the data dump.
- 3 When "DATABASE BACKUP COMPLETE" or "DATADUMP COMPLETE" appears on the terminal, enter: ******** to exit the program.



CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

STAT the hardware

- 1 Load LD 137 and get the status of the hard disks.

Note: Be sure the hard disks are synchronized. If not, synchronize before proceeding.

LD 137

STAT Get the status of the hard disks

TEST CMDU Performs hard and floppy disk test.

**** exit program

- 2 Load LD 135 and get the status of the CPs, CNIs, and memories.

LD 135

STAT CPU Get the status of both CPs and memory

STAT CNI Get the status of all configured CNIs

Check that Core 0 is active

- 1 Be sure Core 0 is active. If Core 1 is active, make Core 0 active:

LD 135

STAT CPU Get status of the CPOS

SCPU Switch to Core 0 (if necessary)

**** exit program

Split the Cores

- 1 From the active side, split the cores:

LD 135

SPLIT Enter Split on the active core

Allow the former active side to INIT before continuing

**** exit program

The system is now in split mode.

Install PSDL file on Core/Net 1

- 1 Place the CP PII Install disk into the MMDU floppy drive of Core 1.
- 2 Install the CD-ROM into the MMDU CD drive of Core 1:
 - a. Press the button on the CD-ROM drive to open the CD-ROM disk holder.
 - b. Place the CD-ROM disk into the holder with the disk label showing.
 - c. Use the four tabs to secure the CD-ROM drive.
 - d. Press the button again to close the CD-ROM disk holder (do not push the holder in by hand).
- 3 Press the manual RESET button on the Core 1 CP II card faceplate.
- 4 Before the install runs, the system validates hard disk partitioning. This takes approximately five minutes. The screen displays:

Testing partition 0

0 percent done... 1 percent done... 99 percent done... 100 percent done

Testing partition 1

0 percent done... 1 percent done... 99 percent done... 100 percent done

0 percent done... 1 percent done... 99 percent done... 100 percent done

Disk physical checking is completed!

There are 3 partitions in disk 0:

The size of partition 0 is XX MB

The size of partition 1 is XX MB

The size of partition 2 is XX MB

Disk partitions and sectors checking is completed!

- 5 At the terminal, press <cr> to start the software installation.

- 6 When prompted, remove the CP PII Install Program diskette, and insert the Keycode diskette.
<a> to continue with keycode validation
<y> to confirm that the keycode matches the CD-ROM release
- 7 When the Install Menu is displayed, select the following option:
<p> To install 3900 set Languages
- 8 The PSDL Installation Menu appears. Select:
1. Install 3900 set languages
- 9 The list of PSDL files that can be downloaded appears. Select the PSDL file you desire.

The install program backs up your current PSDL file and installs the new file. When it is complete, you are returned to the Main Install menu.
- 10 The Main Install menu appears. Select the following options:
<q> to quit (remove any diskettes from the floppy drive)
<y> Yes, to confirm quit
<a> to reboot the system

The system automatically performs a sysload, during which several messages appear on the system terminal. Wait for the DONE and then the INI messages to be displayed before continuing.

Switch call processing to Core/Net 1



CAUTION

Call Processing will be interrupted as Core 1 takes over call processing from Core!

From the active side (Core 0), switch call processing to Core 1.

LD 135

CUTOVR Tell Core 1 to warm start and take over call processing.
Allow Core 1 to come up before proceeding.

**** exit program

Test Core/Net 1

- 1 Test Call Processing. This includes, but is not limited to the following:
 - a. Check for dial tone.
 - b. Make internal, external, and network calls.
 - c. Check attendant console activity.
 - d. Check DID trunks.
 - e. Check any auxiliary processors.

Note: From this point forward you will be upgrading Core/Net 0.

Install PSDL file on Core/Net 1

- 1 Place the CP PII Install disk into the MMDU floppy drive of Core 0.
- 2 Install the CD-ROM into the MMDU CD drive of Core 0:
 - a. Press the button on the CD-ROM drive to open the CD-ROM disk holder.
 - b. Place the CD-ROM disk into the holder with the disk label showing.
 - c. Use the four tabs to secure the CD-ROM drive.
 - d. Press the button again to close the CD-ROM disk holder (do not push the holder in by hand).
 - e. Press the manual RESET button on the Core 0 CP II card faceplate.
 - f. Before the install runs, the system validates hard disk partitioning. This takes about five minutes. The screen displays:

Testing partition 0

0 percent done... 1 percent done... 99 percent done... 100 percent done

Testing partition 1

0 percent done... 1 percent done... 99 percent done... 100 percent done

0 percent done... 1 percent done... 99 percent done... 100 percent done

Disk physical checking is completed!

There are 3 partitions in disk 0:

The size of partition 0 is XX MB

The size of partition 1 is XX MB

The size of partition 2 is XX MB

Disk partitions and sectors checking is completed!

- 3 At the terminal, press <cr> to start the software installation.
- 4 When prompted, remove the CP PII Install Program diskette and insert the Keycode diskette.
 <a> to continue with keycode validation
 <y> to confirm that the keycode matches the CD-ROM release
- 5 When the Install Menu is displayed, select the following option:
 <p> To install 3900 set Languages
- 6 The PSDL Installation Menu appears. Select:
 1. Install 3900 set languages
- 7 The list of PSDL files that can be downloaded appears. Select the PSDL file you desire.

The install program backs up your current PSDL file, and installs the new file. When it is complete, you are returned to the Main Install menu.

- 8 The Main Install menu appears. Select the following options:
 <q> to quit (remove any diskettes from the floppy drive)
 <y> Yes, to confirm quit
 <a> to reboot the system

The system automatically performs a sysload, during which several messages appear on the system terminal. Wait for the DONE and then the INI messages to be displayed before continuing.

Exiting split mode

From the active side (Core 1), join with Core 0 to establish redundancy:

LD 135

JOIN Tell Core 0 to warm start and update its disk image.

Allow Core 0 to come up before proceeding.

******** exit program

Test Core/Net 1 and Core/Net 0

- 1 Perform a redundancy sanity test using the following sequence:

LD 135

STAT CNI Get status of CNI cards

STAT CPU Get status of CPU and memory

TEST CPU Test the inactive Core/Net

TEST CNI c s Test each inactive CNI card

- 2 Switch Cores and test the other side (Core/Net 0)

SCPU Switch cores

TEST CPU Test the inactive Core/Net

TEST CNI c s Test each inactive CNI card

Perform a data dump

- 1 Load the Equipment Data Dump Program (LD 43). At the prompt, enter:
LD 43 to load the program
- 2 When EDD000 appears on the terminal, enter:
EDD to begin the data dump
- 3 When DATABASE BACKUP COMPLETE or DATADUMP
COMPLETE appears on the terminal, enter:
******** to exit the program



CAUTION

If the data dump is not successful, do not continue; contact your technical support organization. A data dump problem must be corrected before proceeding.

The PSDL file has now been installed on your switch.

Commands for System wide Flash Download of M3900 sets

LD 97 – Configure parameters for System-wide Flash Download.

Prompt	Response	Description
REQ	CHG PRT	Change Flash Download parameters. Print Flash Download parameters.
TYPE	FDL	Flash Download for M3900 sets.
FDTF	3902 3903 3904 3905 ALL (NONE)	Enter M3900 set type selected for Flash Download. M3902 telephone M3903 telephone M3904 telephone M3905 telephone All of the above None of the above (default)
FDTM	(NO) YES	Time interval restriction for Flash Download. Do not change time intervals (default). Proceed to change time intervals. Note 1: Flash Download is automatically paused one hour before virtual midnight (see TODR in LD 17) to allow midnight routines to run. Note 2: This option is not applicable to reporting.
FDAY	d n	Enter day and number of time intervals for Flash Download, where: d = day of the week (0-6 for Sunday to Saturday) n = number of time intervals (0-4) To disallow download for the day, enter 0. Day is re-prompted until you enter a Carriage Return, <CR>. Note 1: This prompt appears only if FDTM = YES. Note 2: If two or more intervals are specified, they must be overlapping, non-consecutive, and in order.
FINT	s l	Enter starting hour and length for a time interval, where: s = starting hour (0-23) l = length of interval in hours (1-24) Note: FINT is prompted <i>n</i> time if <i>n</i> is greater than 0.

FTNR	(NO) YES	TN range restriction option for Flash Download. No TN restriction (default) Specify TN range.
FSTN	I s c u c u	Starting terminal number for Flash Download. For Option 11C. Note: The FSTN prompt appears only if FTNR = YES.
FETN	I s c u c u	Ending terminal number for Flash Download. For Option 11C Note: The FETN prompt appears only if FTNR = YES.
FDNR	(NO) YES	DN range restriction option for Flash Download. No DN restriction (default). Specify DN range.
FDDN	c d1 d2	Flash Download Prime Directory Number range, where: c = Customer number (0-99) d1 = starting Prime DN d2 = ending Prime DN Note: Prompt appears only if FDNR = YES.

FRCE	(NO)	System-wide Flash Download control option. Conditional (default).
	YES	System-wide Flash Download (using the FDLS command in LD 32) applies only to an M3900 series set whose flash firmware version is different from the version currently found on the system disk. Forced. Force System-wide Flash Download to all of the specified M3900 series sets regardless of their current flash firmware versions. Note 1: Use this option with caution. Once the download tree is built (that is, after executing FDLS in LD 32), this option automatically reverts to NO. Note 2: This option is not applicable to reporting.
FVER	v	Flash firmware version specified for full report, where: v = Flash firmware version (0-99) If 0, report all versions (default). Note: This option is applicable to reporting only (through the FSUM ALL command in LD 32).

LD 32 – Flash Download commands.

Prompt	Response	Description
.	FDLU l s c u	Initiate conditional download to one telephone. Terminal number, where: l = loop address s = shelf address c = card address u = unit address
.	FDLI l s c u	Initiate conditional download to an M3900 Series telephone when it becomes idle.
.	FDLF l s c u	Initiate a forced download to an M3900 Series telephone regardless of its version and state.
.	FWVU l s c u	Query and print the firmware versions currently on an M3900 Series telephone.

	FDLS	Initiate system-wide Flash Download to all, or a specified type of M3900 Series telephones, based on parameters specified in LD 97.
	FDLC	Cancel or gracefully stop the system-wide flash download for M3900 Series telephones.
	FSUM	Display the summary report of current firmware versions on all M3900 Series telephones. The format of the report is as follows: * * M390x SUMMARY REPORT * * dd - ON DISK ff (cc) - nnnn SETS FOUND ff (cc) - nnnn SETS FOUND Where: x = 2 to 5 for M3902 to M3905 dd = the flash firmware version found on the system disk ff = the downloadable flash firmware version found on the sets cc = the core firmware found on the sets nnnn = the number of sets found with firmware version ff (cc)
	FSUM ALL	Display a complete report on all M3900 series telephones based on parameters specified in LD 97. The format of the report is as follows: TYPE: tttt CUST: cc PDN: dddddd TN: l s c u FW: vv Where: tttt = 3902, 3903, 3904 or 3905 cc = 0-99 dddddd = the Primary DN of the telephone vv = the flash firmware version

List of terms

ACD

Automatic Call Distribution

ACM

Accessory Connection Module

ATA

Analogue Terminal Adapter

COS

Class of Service

CCOS

Controlled Class of Service

CPM

Call Progress Monitor

CPND

Calling Party Name Display

CTIA

Computer Telephony Integrated Adapter

DBA

Display-Based Accessory (Configuration prompt for Display-based Expansion Module)

DLC

Digital Line Card

DN	Directory Number
EIA	Electronic Industries Association
FCC	Federal Communications Commission
FDHF	Full Duplex Handsfree
FFC	Flexible Feature Code
IDF	Intermediate Distribution Frame
KBA	Key-Based Accessory (Configuration prompt for Key-based Expansion Module)
LCD	Liquid Crystal Display
LED	Light Emitting Diode (lamp)
MDF	Main Distribution Frame
MSB	Make Set Busy
MWI	Message Wait Indicator
SCPL	Station Controlled Password Length

SCPW

Station Controlled Password, part of station configuration

TN

Terminal Number

VOT

Virtual Office Terminal

THE
OFFICE OF THE
ATTORNEY GENERAL

STATE OF NEW YORK
IN SENATE
JANUARY 1, 1910

REPORT
OF THE
COMMISSIONER OF THE
LAND OFFICE
FOR THE YEAR
1909

ALBANY:

Meridian 1
M3900 Series
Meridian Digital Telephones
Description, Installation and
Administration

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